

Appendix F
Section 404(b) 1 Guidelines Assessment for the
Toquop Energy Facility

APPENDIX F

Section 404(b)1 Guidelines Assessment for the Toquop Energy Facility

This Appendix presents a summary of the Proposed Action's impacts to waters of the United States and evaluates the impacts according to the Section 404(b)1 Guidelines.

I. Proposed Project

Chapter 2 of the *Proposed Toquop Land Disposal Amendment to the Caliente MFP and FEIS for the Toquop Energy Project*, presents a detailed description of the Toquop Land Disposal Amendment to the Caliente Management Framework Plan (MFP) and Toquop Energy Project.

The project would be located primarily in Lincoln County, Nevada, but a portion of one project feature—the access road to the power plant site—would be in Clark County, Nevada. Prominent landmarks in the project area include Interstate 15 (I-15) and the Virgin River to the south, the Tule Desert and Tule Spring Hills to the north, and the East Mormon Mountains west of the power plant site .

Project features, their operation, and associated actions of the Proposed Action include the following primary elements:

- Issue ROWs by the BLM for constructing and operating the power plant and all related facilities
- *Proposed Toquop Land Disposal Amendment to the Caliente MFP* to identify the southern plant site as suitable for disposal through sale or exchange
- Complete a land exchange between the BLM and NLRC to place the proposed plant site into private ownership
- Construct and operate a 1,100-MW (maximum) combined cycle, natural gas-fired, water-cooled electric generating plant, with connections to a natural gas pipeline and electric transmission lines
- Drill up to an estimated 15 wells in the Tule Desert Basin (Hydrographic Basin #221) over the life of the project sufficient to produce an annual average flow of 3,800 gallons per minute (gpm) (7,100 gpm peak daily) of water for the power plant. It is estimated that the power plant could use up to 7,000 acre-feet of water per year.
- Construct and operate a 12.5-mile-long, 24-inch-diameter buried water pipeline extending from the wellfield in the Tule Desert, through Toquop Gap, to the power plant near the Toquop Wash

- Construct and operate a manifold collection system to interconnect the water output from the wellfield to a pressure-regulating water tank
- Construct and operate a pressure-regulating water tank located near the wellfield before the water pipeline to the power plant
- Construct and operate buried electric distribution power lines from the power plant to the well pumps
- Pave to a width of 24 feet and straightening sections of 14.4 miles of an existing dirt and gravel road (locally known as the Halfway Wash Road and utility corridor road) to produce an access road extending from I-15 to the plant site
- Provide a 12.5-mile-long access right-of-way along an existing dirt and gravel road for maintenance activities between the power plant and the ground water wellfield

A. Specific Activity that Requires a Department of the Army Permit

Specific activities requiring a Department of Army permit (Clean Water Act Section 404) include fill activities associated with construction of roadway improvements for the access road to the Toquop Energy Facility, construction of the plant site, and construction of the water pipeline.

B. Purpose and Need

1. Purpose and Need

The purpose and need for the proposed project, as described in Section 1 of the *Proposed Toquop Land Disposal Amendment to the Caliente MFP and FEIS for the Toquop Energy Project*, is as follows:

The proposed plant would generate electrical power at competitive costs for use by consumers to ease the near- and long-term shortages of power in the western United States. The proposed project would contribute to meeting the demand for power in the Western Systems Coordinating Council (WSCC) service area, including the Las Vegas area, and would also contribute to meeting the capacity and annual energy requirements for the remainder of the Arizona-New Mexico-southern Nevada power area.

The project would provide economic benefits to Lincoln County, Nevada, which will provide opportunities for additional industrial development resulting in an increased tax base and increased employment opportunities.

Responding to a request for a land exchange, the project would provide the BLM with a mechanism for acquiring a desirable parcel of private land in the Pah Rah Range in northwestern Nevada and would facilitate public land management by the BLM by creating contiguous tracts of land.

The WSCC estimates a demand for approximately 11,300 MW of new power plant generation to be constructed in its region of the western United States over the next 10 years to maintain reliable operation of the transmission system. The Toquop project would

provide much needed support to the overall energy supply in this region and contribute approximately 10 percent of the projected demand for new generation within the WSCC. Based on data available from the WSCC, the 2002 Operating Reserve Margin (the difference between available capacity, excluding transfers, and peak demand) for the Las Vegas area and the Arizona-New Mexico-southern Nevada area is minus 2.9 percent. This indicates that the area relies on importing electricity to meet peak demands. This situation is the result of growth in the demand for electricity to serve a fast growing region. The proposed project would significantly strengthen the electric grid in the Las Vegas area, including the City of Mesquite, based on the flow of electric power on the existing transmission system.

Needed and desired economic benefits would result from the construction and operation of the power plant. Lincoln County is approximately 98 percent public land with limited industrial and commercial development. Lincoln County ranks near the bottom among Nevada's counties in population, total personal and per capita income, and tax revenues. Development of the proposed power plant and associated linear facilities would provide important increases to the Lincoln County tax base through sales, use, and property taxes on the power plant improvements. The construction and operation of the power plant would have positive effects on employment opportunities and result in increased revenue from project-related purchases of goods and services.

The land exchange would be between NLRC and BLM's Ely Field Office. NLRC owns over 1.2 million acres of land in northern Nevada, lying in a checkerboard pattern interspersed with other privately owned and federally managed public lands. Much of the NLRC land has many resources desirable to the BLM (such as sage grouse habitat) and is identified for acquisition in BLM land use plans. Since certain disposable BLM-managed lands are desirable for economic development by NLRC, this land exchange would benefit both parties and the general public.

2. Overall Project Purpose for 404(b)(1) Alternatives Analysis

Purpose

The proposed plant would generate electrical power at competitive costs for use by consumers to ease the near- and long-term shortages of power in the western United States. The proposed project would contribute to meeting the demand for power in the Western Systems Coordinating Council (WSCC) service area, including the Las Vegas area, and would also contribute to meeting the capacity and annual energy requirements for the remainder of the Arizona-New Mexico-southern Nevada power area.

The project would provide economic benefits to Lincoln County, Nevada, which will provide opportunities for an increased tax base and increased employment opportunities.

The project would provide the BLM with a mechanism for acquiring a desirable parcel of private land in the Pah Rah Range in northwestern Nevada and would facilitate public land management by the BLM by creating contiguous tracts of land.

Need and Background

The WSCC estimates a demand for approximately 11,300 MW of new power plant generation to be constructed in its region of the western United States over the next 10 years to maintain reliable operation of the transmission system. The Toquop project would provide much needed support to the overall energy supply in this region and contribute

approximately 10 percent of the projected demand for new generation within the WSCC. Based on data available from the WSCC, the 2002 Operating Reserve Margin (the difference between available capacity, excluding transfers, and peak demand) for the Las Vegas area and the Arizona-New Mexico-southern Nevada area is minus 2.9 percent. This indicates that the area relies on importing electricity to meet peak demands. This situation is the result of growth in the demand for electricity to serve a fast growing region. The proposed project would significantly strengthen the electric grid in the Las Vegas area, including the City of Mesquite, based on the flow of electric power on the existing transmission system.

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Development of the proposed power plant and associated linear facilities would provide important increases to the Lincoln County tax base through sales, use, and property taxes on the power plant improvements. The construction and operation of the power plant would have positive effects on employment opportunities and result in increased revenue from project-related purchases of goods and services.

The land exchange would be between NLRC and BLM's Carson City Field Office. NLRC owns over 1.2 million acres of land in northern Nevada, lying in a checkerboard pattern interspersed with other privately owned and federally managed public lands. Much of the NLRC land has many resources desirable to the BLM (such as sage grouse habitat) and is identified for acquisition in BLM land use plans. Since certain disposable BLM-managed lands are desirable for economic development by NLRC, this land exchange would benefit both parties and the general public.

3. Corps' Determination of Basic Project Purpose (Water Dependency Test)

The basic project purpose is to construct and maintain the Toquop Energy Facility. The 404(b)(1) Guidelines concepts of basic project purpose and water dependency apply only when projects discharge dredged or fill material into a special aquatic site. Since there are no special aquatic sites within the scope of this project, the presumption of available practicable non-special aquatic alternative sites does not apply.

C. Scope of Analysis under National Environmental Policy Act (NEPA)

The scope of analysis encompasses the Proposed Action for the Toquop Energy Facility, which includes the improved roadway access to the project site, the Energy Facility Site itself, and the proposed water pipeline between the proposed well field and the Energy Facility.

The Proposed Action would not affect wetlands or riparian zones present at springs because these resources do not occur at the proposed sites of project features. The Proposed Action would affect a number of named and unnamed ephemeral washes. Named ephemeral washes that would be affected by the Proposed Action include Halfway Wash, Toquop Wash, South Fork Toquop Wash, and Sam's Camp Wash.

Jurisdictional delineations of waters of the United States were reviewed by Grady McNure of the U.S. Army Corps of Engineers during a site visit on November 14, 2002. The proposed access road would cross approximately 38 ephemeral washes, including Halfway Wash, that either intersect or parallel the proposed roadway. Two small ephemeral washes are located within the proposed plant site. These washes are approximately 8 feet wide and flow into Toquop Wash. The proposed water pipeline would affect ten ephemeral washes, including Toquop Wash, South Fork Toquop Wash, and Sam's Camp Wash. The proposed water pipeline would be located within and parallel to the streambed of the Toquop Wash within the Toquop Gap. The proposed pipeline would parallel the Toquop Wash streambed for an estimated 2,000 feet. The pipeline alignment within Toquop Gap will be refined during the final engineering design phase to specifically minimize impacts to areas of riparian vegetation within the Gap. The impacts associated with the installation of the proposed water pipeline would be temporary impacts because the right-of-way would be restored to pre-construction contours upon completion of construction activities.

Alternatives (33 CFR 320.4(b)(4), 40 CFR 230.10)

1. No Action Alternative

Under the No Action Alternative, the Caliente MFP would not be amended, none of the project-related land exchanges would occur, project-related rights-of-way would not be created, and the power plant and related facilities would not be built or operated as described for the Proposed Action or the Action Alternatives.

If the No Action Alternative is selected for implementation, existing conditions and trends that are described for the affected environment in *Chapter 3, Affected Environment*, of the *Proposed Toquop Land Disposal Amendment to the Caliente MFP and FEIS for the Toquop Energy Project*, would continue. None of the project purposes and needs that are described in Section 1.2 and 1.3 of the *Proposed Toquop Land Disposal Amendment to the Caliente MFP and FEIS for the Toquop Energy Project* (and presented above) would be met.

2. Sequenced Search for Less Environmentally Damaging Alternatives

a. Other Sites

Alternative project locations were considered but eliminated from consideration because they would not meet the project purposes and needs described in Chapter 1 of the *Proposed Toquop Land Disposal Amendment to the Caliente MFP and FEIS for the Toquop Energy Project* and presented above. The project area was selected because it presents the greatest benefits to all parties involved, including: benefits to Toquop Energy and consumers through the cost-effective generation and sale of electric power to help meet local and regional shortages; to the BLM through their acquisition of a desirable parcel of land that is presently in private ownership; and to Lincoln County through increased economic benefits associated with project development. Alternative project locations presented unacceptable environmental impacts (proximity to Class I areas and Areas of Critical Environmental Concern [ACECs]); greater impairment of visual, biological, and ground water resources; difficulty and additional costs for fuel delivery and transmission line access; and lack of economic benefits to communities within and near Lincoln County.

b. Other Project Designs

Alternative 1

BLM actions that could occur under Alternative 1 include issuing ROWs necessary for project construction and operation, proceeding with this Proposed Toquop Land Disposal Amendment to the Caliente MFP, and completing the Toquop land disposal through sale or exchange. The ROW issued by the BLM for the construction and operation of a water pipeline and buried electric distribution power lines under Alternative 1 would be for an eastern rather than a western alignment.

The water pipeline would follow a more easterly alignment under Alternative 1 than under the Proposed Action. This eastern alignment would follow the existing road that extends south-southeast from the Tule Desert to the Toquop Wash plant site, with one exception. On its southern end, the pipeline would depart from the road and follow along the west side of a range line south for about 3 miles in order to avoid the FWS-designated desert tortoise critical habitat, which is on the east side of the rangeline in this area (see Map 2-2 and desert tortoise discussions in Section 3.1, Threatened, Endangered, and Sensitive Species). The ground water well pumps would pump directly to a raw water storage tank located on an intermediate high point several miles southeast of the wellfield. The aboveground storage tank (configuration and color to be determined during final design to blend with background conditions) would then feed the water by gravity to the power plant. The storage tank would have a capacity of approximately 500,000 gallons and disturb no more than 1 acre of land. Electric distribution power lines from the power plant to the well pumps would be buried adjacent to the water pipeline.

The total length of this water pipeline would be 12.6 miles, or 0.1 mile longer than the more westerly route described for the Proposed Action. Its construction ROW (60 feet wide and 92 acres) and long-term right-of-way (30 feet wide and 46 acres) would be nearly identical in size to the western alignment under the Proposed Action. It would also have three 3-acre staging areas for construction: one near the north end; one near the mid-point of the pipeline; and one in the power plant site. Because the acreage for the third site is included in the total for the power plant site, water pipeline staging areas are considered to total 6 acres. All disturbed lands within these rights-of-way and staging areas would be reclaimed. Approximately 85 percent of the pipeline would run next to the existing road. This would provide easier, quicker access than the western alignment for larger vehicles should major maintenance or repair be necessary. In addition to being slightly longer, this alternative pipeline route would cross the main stem of the Toquop Wash at one of its deepest points (140 feet).

Alternative 2

BLM actions that could occur under the Alternative 2 include issuing ROWs necessary for project construction and operation, proceeding with this Proposed Toquop Land Disposal Amendment to the Caliente MFP, and completing the Toquop land disposal through sale or exchange.

However, specific actions could differ because of differences in the parcels of land to be disposed, location of the power plant site, and the nature and extent of the utility corridor and access road (see Map 2-3). In addition to the ROWs described for the Proposed Action, the BLM would issue ROWs for the construction and operation of an extended access road,

a buried natural gas pipeline, and an overhead electric transmission line corridor that would be necessary for this northern power plant site. However, the water pipeline ROW would not be needed for this alternative. The BLM could amend the Caliente MFP in order to identify a parcel of public land in the Tule Desert in Lincoln County that is presently being managed by the BLM as being suitable for disposal through sale or exchange. The Tule Desert parcel would then serve as the power plant site under Alternative 2.

Locating the power plant in the Tule Desert under Alternative 2 would require the construction of 12.0 miles of buried natural gas pipeline to bring fuel to the site, and 12.0 miles of an overhead electric transmission interconnection to carry net power production to the Navajo-McCullough Electric Transmission Line and the Red Butte-Harry Allen Electric Transmission Line. It is anticipated that the gas pipeline would be 20 inches in diameter and the transmission interconnection would be 500-kV and 345-kV overhead lines, similar to the receiving transmission line. Both lines would be placed in a 120-foot-wide right-of-way adjacent to an existing road. Because of its width, construction staging areas would be located within the right-of-way.

Constructing an additional 12.2 miles of access road would be required to reach the plant site under Alternative 2. This access road would continue from its proposed terminus described for the Toquop Wash power plant site under the Proposed Action, cross the Toquop Wash, proceed north through desert tortoise critical habitat (but outside an ACEC) for approximately 4.3 miles to the range line, then continue along the existing dirt road alignment to the Tule Desert plant site. This alignment would involve extensive grading, sub-base preparation, straightening, and paving of this primitive road, except where the road crosses the Toquop Wash. At this location, the road would only be smoothed and flattened slightly to facilitate the passage of larger construction equipment. In the event of intermittent flooding, access across the Toquop Wash would be delayed until flood waters subside or, alternatively, the power plant site would be accessed via the Carp-Elgin Road.

Alternative 3

BLM actions that could occur under the Proposed Action include issuing ROWs necessary for project construction and operation, proceeding with this Proposed Toquop Land Disposal Amendment to the Caliente MFP, and completing the Toquop land disposal through sale or exchange. However, the power plant would be air-cooled. Map 2-6 shows the detailed location of the power plant site for Alternative 3.1

II. NEPA Environmental Factors and Public Interest Factors Considered

A. Anticipated Changes to the Physical/Chemical Characteristics of the Aquatic Environment

1. Substrate

The Proposed Action would not adversely impact portions of the waters of the United States' ephemeral wash substrate outside of the project area. Alluvial deposits within

portions of the ephemeral washes within the project area appear to be homogeneous in composition. Construction activities are not expected to expose substrate material that substantially varies in composition or chemistry from the current substrate.

2. Currents, Circulation or Drainage Patterns

Currents and circulation are generally not significant factors in ephemeral stream hydrology. The proposed project is located in ephemeral washes and normal flows are generally restricted to storm event runoff. There is no established permanent or fluctuating baseflow within the ephemeral washes. The Proposed Action would most likely create localized variations in the hydraulic characteristics of each of the washes during flow events. The overall cumulative impact of the localized variations, however, is expected to be relatively insignificant, and localized within the vicinity of the Proposed Action.

3. Suspended Particulates; Turbidity

The Proposed Action would most likely cause temporary increases in suspended particulates and turbidity within the ephemeral washes during storm runoff events that may potentially occur during construction. This effect is expected to be minor, however, and would cease at the completion of construction. Surface flow is not usually present and may be present for only a short time following heavy rainfall.

4. Water Quality (Temperature, Salinity Patterns and Other Parameters)

Both project construction and operation in the Toquop area provide opportunity to potentially affect the surface water quality of the local washes and, in turn, the Virgin River. Water quality in the washes could be degraded by the addition of both suspended solids (sediment) and dissolved constituents (substances commonly found in stormwater runoff from parking lots and industrial areas).

During construction, earthmoving activities could increase the potential for erosion from precipitation, which, in turn, would contribute additional suspended solids (sediment load) to the runoff in the local washes. During operation, diverted runoff from the wash filled in to accommodate construction of the power plant could increase the potential for erosion, and, therefore, result in increased sediment loads in the receiving wash(es).

In addition, runoff from parking surfaces and possibly areas where plant equipment could come in contact with precipitation could add low concentrations of dissolved petroleum hydrocarbons, metals, and possibly other substances to the runoff in the local washes. Runoff from the access road could also contribute low concentrations of similar dissolved substances to the flows in the local washes.

With the implementation of commitments in Appendix B of the *Proposed Toquop Land Disposal Amendment to the Caliente MFP and FEIS for the Toquop Energy Project*, no impacts to surface water quality are anticipated from the utilities that link the wellfield to the plant site, or from the development and operation of the wellfield.

5. Flood Control Functions

The effect to flood control functions under the Proposed Action would not be significant. The Proposed Action should have limited short-term effects upstream and downstream of

the project during construction, and relatively no effect to flood control subsequent to construction.

Locally high-intensity rainfall events could cause the local washes in the Toquop project area to carry high volumes of runoff for short periods of time. Some of the features of the Proposed Action are located within a Zone D flood area (undetermined flood hazards) as designated by FEMA.

The flooding potential, however, results mainly from flows in the smaller local washes and not from flows in either the Toquop Wash or the South Fork Toquop Wash, the two principal surface water drainage features in the project area. This conclusion is based on the fact that each of these larger washes has cut deep canyons or arroyos within the project area that are anticipated to contain flows that correspond to a maximum 100-year return interval runoff events.

Plant Site

Six small, unnamed washes cross Section 36 where the power plant would be located under the Proposed Action and two of the washes are within or immediately adjacent to the plant site. The specific disturbed area where the plant structures and facilities would be constructed directly straddles one of these washes. That particular wash, therefore, would be filled and its watercourse diverted to one or more adjacent washes. As a result, the amount and rate of flow in the wash(es) that receive(s) the diverted flows would increase when local rainfall events are great enough to generate runoff.

Construction of the power plant would create areas that are impervious (covered by impermeable surfaces such as roofs, roads, parking areas), which would increase the amount and rate of flow of runoff from local storms. The total area rendered impervious would be approximately 15 acres. Assuming that the maximum daily rainfall at the plant site is approximately 3 inches, the corresponding stormwater runoff from the 15 acres of impervious surfaces would be approximately 3.75 acre-feet, or approximately 2 cubic feet per second (cfs) averaged over 24 hours.

Linear Facilities

During both construction and operation, the linear facilities associated with the Proposed Action (such as, access road, water pipeline, and electricity to the wellfield) would not affect the ephemeral washes they cross.

Under the Proposed Action, the utilities (water pipeline and electricity to the wellfield) would be routed across several washes, including the South Fork Toquop Wash, and through the Toquop Gap, which is the watercourse of the main Toquop Wash. Where the utilities cross the various washes, particularly the Toquop and the South Fork, the utilities would be buried sufficiently deep so as not to affect water flow or erosional processes (scouring) in the bottom of these washes.

The access road under the Proposed Action will utilize culverts to channel storm water under the road. These culverts will be sized appropriately according to local requirements. Therefore, the road would experience flooding only during extreme runoff events, and flooding would not constitute an environmental impact.

6. Storm, Wave and Erosion Buffers

Not applicable. The Proposed Action will not interfere with, and was not designed to function as a storm, wave, or erosion buffer.

7. Erosion and Accretion Patterns

Both project construction and operation in the Toquop area provide opportunity to potentially affect the surface water quality of the local washes and, in turn, the Virgin River. Water quality in the washes could be degraded by the addition of both suspended solids (sediment) and dissolved constituents (substances commonly found in stormwater runoff from parking lots and industrial areas).

During construction, earthmoving activities could increase the potential for erosion from precipitation, which, in turn, would contribute additional suspended solids (sediment load) to the runoff in the local washes. During operation, diverted runoff from the wash filled in to accommodate construction of the power plant could increase the potential for erosion, and, therefore, result in increased sediment loads in the receiving wash(es).

With the implementation of commitments in Appendix B of the *Proposed Toquop Land Disposal Amendment to the Caliente MFP and FEIS for the Toquop Energy Project*, no impacts to erosion or surface water quality are anticipated from the utilities that link the wellfield to the plant site, or from the development and operation of the wellfield.

8. Aquifer Recharge

Under the Proposed Action, pumping water from the fractured-rock aquifer in the Tule Desert in the amount and rates necessary to serve the proposed project would not result in a substantial decline in ground water levels or a substantial depletion of ground water resources. Water levels within the Tule Desert would be lowered as a result of project pumping, but not to the extent that a substantial depletion of ground water resources would occur.

Outside the Tule Desert, specifically in the Virgin River Valley hydrographic area, ground water levels, as well as the availability of the ground water resources, would remain unchanged as a result of pumping in the Tule Desert.

With respect to the regional carbonate-aquifer system, the rate of ground water extraction for this project would be only a small fraction of the total capacity of the aquifer. Within the Colorado River Basin, the flow has been estimated to be approximately 200,000 afy (see *Section 4.2.1, Ground Water Resource of the Proposed Toquop Land Disposal Amendment to the Caliente MFP and FEIS for the Toquop Energy Project*). The project demand of approximately 7,000 afy is 3.5 percent of that amount. The Nevada State Engineer has approved 2,100 acre-feet of water per year of the Vidler Water Company - Lincoln County water right applications. Vidler Water Company - Lincoln County have an application for additional water allocations adequate to operate the power plant. The application is being held aside pending results of additional hydrologic studies.

9. Baseflow

The washes within the Proposed Action are ephemeral, and normal flows are generally restricted to storm event runoff, thus there is no baseflow. Construction of the Proposed Action, should, therefore, have no impact on the baseflow of the ephemeral washes within the project area.

10. Mixing Zone

(In light of the depth of water at the disposal site; current velocity, direction and variability at the disposal site; degree of turbulence; water column stratification; discharge vessel speed and direction; rate of discharge; dredged material characteristics; number of discharges per unit of time; and any other relevant factors affecting rates and patterns of mixing.)

The ephemeral washes within the Proposed Action are normally dry. All discharges of dredged and/or fill material would occur when there is no flow in the washes so there would be no mixing effects to consider.

All construction activities would be completed in dry riverbeds. Construction would cease during flow events within the washes, and all equipment would be removed from within the ordinary high water mark (OHWM) until flows subside. Any other discharge of fill material that would occur is expected to be minimal.

B. Anticipated Changes to the Biological Characteristics of the Aquatic Environment

1. Special Aquatic Sites (Wetlands, Mudflats, Coral Reefs, Pool and Riffle Areas, Vegetated Shallows, Sanctuaries and Refuges, Defined In 40 CFR 230.40-45)

No special aquatic sites are present within the Proposed Action.

2. Habitat for Fish and other Aquatic Organisms

No perennial water exists within the Proposed Action to support fish or other aquatic organisms.

The Proposed Action would not adversely effect any fish habitat and would have only a very minimal, if any, effect on other aquatic organisms. Because the surface waters within the Proposed Action are ephemeral, fish are not expected to be present. A limited group of aquatic organisms are capable of utilizing the ephemeral surface water when it is present. The Proposed Action would not affect these organism's use of the post-construction ephemeral water flows above or below the project area.

3. Wildlife Habitat (Breeding, Cover, Food, Travel, General)

Direct and indirect impacts on wildlife and wildlife habitat would result from implementing the Proposed Action. Direct impacts would result from ground disturbance during construction-related activities and project operation and maintenance that would total 449 acres. Following reclamation, the net new long-term disturbance would be 182 acres. Direct impacts would also occur from vehicle-wildlife conflicts during construction and operation. Desert bighorn sheep may be impacted by increased traffic on that portion of the

access road between the proposed plant site and I-15 where it passes through a portion of the East Mormon foothills. Indirect impacts would result from increased public access and project maintenance. Habitat loss through the loss of vegetative cover would have an adverse effect on wildlife species dependent on vegetation for food or cover. In general, impacts on wildlife and wildlife habitat would be the same as those described in detail in *Section 4.5.1 of the Proposed Toquop Land Disposal Amendment to the Caliente MFP and FEIS for the Toquop Energy Project* for threatened, endangered, and sensitive species of plants and wildlife.

Impacts on reptiles and small mammals would occur as a result of the ground disturbance associated with project construction, operation, and maintenance. Direct impacts to reptiles and small mammal species would include mortalities from construction activity and vehicular traffic. Reptile habitat would be destroyed as a result of earth moving activities, and direct mortalities may result from reptiles being crushed underground or run over by earth moving equipment. Some wildlife species would be temporarily displaced during construction activities.

During construction, dust and other construction-related disturbances may affect plants and wildlife. Construction may possibly fragment existing habitat use patterns, leading to a reduction in quality of habitat adjacent to new construction.

No direct or indirect impacts on aquatic habitat and fisheries of the Virgin River would result from ground water pumping for the Proposed Action. No short-term, adverse impacts from ground water pumping on the availability of water to wildlife are anticipated.

The evaporation pond for the Toquop power plant would be located in an area with few water sources. Especially because of this isolation, it may attract waterfowl, shorebirds, and other waterbirds, thereby creating possible exposures of birds to highly saline water at the power plant. The ions in the pond water (e.g., Na⁺, K⁺, Cl⁻, and SO₄⁻) are generally non-toxic and are not considered problematic to wildlife at normal environmental levels. However, concentrations of sodium (147,963 ppm) expected in the evaporation pond far exceed those associated with adverse effects in waterfowl; therefore, risk of mortality in waterfowl utilizing the pond is likely. For example, sodium concentrations are more than ten times the levels that reduced growth or survival of mallard ducklings, and nearly ten times the levels associated with a die-off of adult waterfowl in North Dakota when fresh water was unavailable. Similarly, the expected sodium concentration is almost twice that found in process pond waters at an industrial site on Searles dry lake bed in California where dehydration (from lack of a freshwater source) or sodium toxicity caused bird mortality. Sodium toxicosis was also observed in ruddy ducks utilizing agricultural evaporation ponds in California that had sodium concentrations about one-fourth of those estimated for the Toquop evaporation pond.

High levels of salinity, especially when coupled with low ambient temperatures (<4° C), can result in salt encrustation on the feathers of waterfowl and other waterbirds. This encrustation of salt on the feathers results in the inability of the birds to fly to freshwater sources or continue migration, which may result in their death (possibly by drowning). Salt encrustation on waterfowl feathers and mortality were observed in several field studies (including those mentioned above) and in another hypersaline wetland with electrical conductivity lower than that estimated for the evaporation pond. Appendix E, Salinity

Effects on Birds, provides additional detail on the expected chemical make-up of water in the evaporation pond and possible effects on birds. (See Section 4.5.4.1.2 in the *Proposed Toquop Land Disposal Amendment to the Caliente MFP and FEIS for the Toquop Energy Project* regarding mitigation of potential pond impacts on waterfowl.)

The Toquop area, and the Pah Rah parcel described below, are both mostly undisturbed, but support very different plant and wildlife communities. Both support wildlife habitat of value to Nevada and the nation.

4. Endangered or Threatened Species

a. Listed Endangered and/or Threatened Species or Designated Critical Habitat Present on Site

Direct impacts (effects) on threatened, endangered, and sensitive species can result from ground disturbance caused by construction-related activities and project operation and maintenance. Indirect impacts can result from increased public access and project maintenance. Ground disturbance impacts vegetation by habitat destruction and degradation resulting from soil compaction and vegetation removal, and by erosion when vegetation is lost. The loss of vegetative cover can adversely affect sensitive wildlife species dependent on vegetation for food or cover. Impacts can occur as a result of construction, operation, and maintenance of the power plant and associated facilities.

Ground disturbance can also have a more permanent impact because of the take of wildlife species. Wildlife can be adversely impacted by increased human activity that causes wildlife harassment, legal and non-legal take of wildlife species, take from vehicles on roads or increased off-road use, and general disturbance of wildlife. Long-term impacts can occur from loss of vegetation and wildlife habitat resulting from the slow process of revegetation in disturbed areas, because of erosion, or continued disturbance from maintenance.

Desert Tortoise. Table 4-1 of the *Proposed Toquop Land Disposal Amendment to the Caliente MFP and FEIS for the Toquop Energy Project* lists acres of desert tortoise designated critical habitat and desert tortoise habitat not designated as critical that would be temporarily or permanently disturbed under the Proposed Action and Alternatives 1, 2, and 3. Direct impacts on desert tortoise habitat would result from ground disturbing construction activities. Project features and construction rights-of-way associated with the Proposed Action would be located on approximately 449 acres of desert tortoise habitat, 222 acres of which have been designated as critical habitat. Assuming an average density of approximately 11 desert tortoises per square mile (640 acres) in the general area (see Affected Environment discussions in *Section 3.5.1, Threatened, Endangered, and Sensitive Species* of the *Proposed Toquop Land Disposal Amendment to the Caliente MFP and FEIS for the Toquop Energy Project*), 449 acres would provide habitat for 8 desert tortoises. The net new long-term disturbance of 182 acres, following reclamation of disturbed sites (see Table 4-1), would provide habitat for three desert tortoises. The resultant short-term and long-term loss of vegetation would reduce the amount of forage available to tortoises. Activities associated with project construction could potentially injure or kill tortoises. Vehicles and heavy construction equipment pose the greatest hazard to tortoises and their burrows. Tortoise fencing installed along the access road under the Proposed Action would minimize or eliminate the potential for highway-related mortality (see below and *Appendix A, Measures for Protecting Desert Tortoises and Their Habitat*, of the *Proposed Toquop*

Land Disposal Amendment to the Caliente MFP and FEIS for the Toquop Energy Project, for a discussion of this and other desert tortoise mitigation measures). This access road would pass through the Mormon Mesa ACEC and desert tortoise critical habitat.

Indirect impacts on tortoises could result from increases in human activity during construction, operation, and maintenance. Impacts from increased human activity could include further habitat disturbance from recreational OHV activity, direct mortality from off-road vehicles crushing tortoises, increased illegal collecting of tortoises, and mortality from vandalism (for example, shooting). Mitigation measures, particularly fencing requirements, would be effective in reducing potential impacts from traffic on the access road to the plant site. With tortoise undercrossings provided at intervals of not greater than 1 mile on the access road, habitat fragmentation resulting from road improvements would not be a concern. Potential impacts from maintenance of the water pipeline would be greatly reduced through worker education measures.

Southwestern Willow Flycatcher, Yuma Clapper Rail, Woundfin, and Virgin River Chub. Implementing the Proposed Action would have no direct or indirect impact on riparian or aquatic habitats of the Virgin River on which these species depend.

No mitigation is proposed; however, the project includes measures to protect desert tortoise and their habitat (see Appendix A of the *Proposed Toquop Land Disposal Amendment to the Caliente MFP and FEIS for the Toquop Energy Project*). Measures have been established in the Approved Caliente Management Framework Plan Amendment (APA) and Record of Decision (ROD) for the Management of Desert Tortoise Habitat (BLM, 2000) and are applicable to this proposed project. These measures include the Terms and Conditions to implement the Reasonable and Prudent Measures in the US Fish and Wildlife Service's (FWS) Biological Opinion (BO) for the APA (FWS, 2000). Of the eight Reasonable and Prudent Measures implemented to reduce the take of desert tortoises and their habitat, Numbers 5, 6, and 7 are applicable to this project. Also included are the Standard Operating Procedures (SOP) that were issued by BLM to aid in the recovery of the desert tortoise. These measures are consistent with those developed for the Clark County Multiple Species HCP and EIS (Clark County, 2000). For the Toquop Energy Project, permanent tortoise-proof fencing will be required for the access road from I-15 to the plant because the road is within an ACEC. Measures to protect desert tortoise, in addition to those commitments contained in Appendix A, may be further developed during formal consultation with the FWS under Section 7 of the ESA and stipulated in the BO for this project.

b. Proposed Listed Endangered and/or Threatened Species or Proposed Critical Habitat Present on Site

The Gila monster and chuckwalla likely occur in the project area, particularly in areas with rocky outcrops. Both species would be subjected to the same impacts described for desert tortoises. Impacts on migratory birds identified in *Section 3.5.1, Threatened, Endangered, and Sensitive Species* of the *Proposed Toquop Land Disposal Amendment to the Caliente MFP and FEIS for the Toquop Energy Project*, including the Fish and Wildlife Service candidate species, the yellow-billed cuckoo, would be avoided as long as nests are not disturbed during the breeding season. No significant bat roosts are known to occur within or adjacent to the construction zones and, therefore, no impacts are anticipated.

Appendix B, Standard Construction and Operation Procedures, of the Proposed Toquop Land Disposal Amendment to the Caliente MFP and FEIS for the Toquop Energy Project, contains measures to prevent or minimize the potential for impacts on other special status species. Examples include consideration of bird breeding seasons, burrowing owls, bat roosts (if encountered), Gila monsters, and chuckwallas.

c. Compliance with ESA - Formal/Informal Consultation or Conference

A biological Assessment has been submitted. No Biological Opinion has been issued.

5. Biological Availability of Possible Contaminants in Dredged or Fill Material, Considering Hydrography in Relation to Known or Anticipated Sources of Contaminants; Results of Previous Testing of Material from the Vicinity of the Project; Known Significant Sources of Persistent Pesticides from Land Runoff or Percolation; Spill Records for Petroleum Products or Designated (Section 311 of the CWA) Hazardous Substances; other Public Records of Significant Introduction of Contaminants from Industries, Municipalities or other Sources

The project proponent is not aware of any possible contaminants that the proposed activity would make more biologically available.

6. General Environmental Concerns

C. Anticipated Changes to the Human Use Characteristics of the Aquatic Environment

1. Existing and Potential Water Supplies; Water Conservation

Section 4.4 of the Proposed Toquop Land Disposal Amendment to the Caliente MFP and FEIS for the Toquop Energy Project evaluates the potential impacts associated with pumping ground water from the Tule Desert to supply up to 7,000 acre-feet of water per year (afy) for 42 years to the proposed project. These impacts not only include the potential project-induced effects on ground water resources, but also the potential project-induced effects on other water resources (springs and surface water bodies).

Pumping water from the fractured-rock aquifer in the Tule Desert in the amount and rates necessary to serve the proposed project would not result in a substantial decline in ground water levels or a substantial depletion of ground water resources. Water levels within the Tule Desert would be lowered as a result of project pumping, but not to the extent that a substantial depletion of ground water resources would occur.

Outside the Tule Desert, specifically in the Virgin River Valley hydrographic area, ground water levels, as well as the availability of the ground water resources, would remain unchanged as a result of pumping in the Tule Desert.

Specifically, based on the results of an analysis of potential water level decline (drawdown) presented in CH2M HILL (2002), ground water levels will be lowered within the Tule Desert a minimum of approximately 45 feet within a radius of approximately 1,000 feet from a representative production well (pumping at a rate of 1,100 gallons per minute [gpm]) under the conditions determined from the local aquifer testing (see *Section 3.4.2.1.2, Ground Water in the Fractured Rock*). The maximum drawdown would remain above the top of the fractured-rock aquifer and no de-watering of the aquifer would occur.

The same representative well would drawdown the water level 0.5 foot at a distance of roughly 1.5 miles from the well. Beyond 1.5 miles from a representative well, the drawdown would be less than 0.5 foot. Accordingly, project pumping would not result in a substantial water-level decline outside of the Tule Desert because the wellfield would be designed such that the wells would be: 1) spaced to minimize additive effects on drawdown; and 2) located at least 1.5 miles from the edge of the Virgin River Valley hydrographic area.

These results occur largely because of the steep lateral hydraulic gradient in the Tule Desert fractured-rock aquifer (discussed in *Section 3.4.2.1.2, Ground Water in the Fractured Rock*). The steep gradient is indicative of the relatively poor ability of the Tule Desert fractured-rock aquifer to transmit ground water (low transmissivity), which acts to limit the lateral extent of water level decline around a pumping well (that is, the lower the transmissivity, the smaller the radius of influence around a well). In addition, the steep gradient means that most of the water entering the project wells would do so from the upgradient direction (from the north in the Tule Desert), causing water level declines to be less over a similar distance south of the production wells toward the downgradient Virgin River Valley.

Although the water levels will be lowered in the vicinity of each production well, there would be no major dewatering of the fractured rock aquifer or depletion of the ground water resource within the Tule Desert. The amount of annual ground water flow through a 4-mile wide portion of the basin within the fractured-rock aquifer has been estimated to be slightly less (6,500 afy) than the amount of water required for the project (up to 7,000 afy). Additional ground water also flows within the Tule Desert outside this 4-mile width and at depths greater than investigated to date.

As long as the fractured-rock aquifer is not de-watered (that is, the water level does not decline below the top of the fractured rock), the lower water levels correspond to a localized decrease in the pressure exerted by the water in the fractures, and do not represent a major loss of water from storage. This occurs because the aquifer is confined under pressure, and would continue to be confined during project pumping as long as the fractured rock remains fully saturated.

In the Tule Desert basin-fill deposits, the actual extent of the water level decline that would be caused by project pumping is unknown because of the aquifer complexity and the limited available data. However, the amount of ground water level decline in the basin-fill would be no greater than that anticipated for the fractured rock, and most likely considerable less based on the understanding that the ability of the basin-fill deposits to transmit water (aquifer transmissivity) is very low and because ground water in the basin fill is assumed to be unconfined (see *Section 3.4.2.1.1, Ground Water in the Basin Fill* and CH2M HILL, 2002). For the purpose of this impacts assessment, the water level decline is conservatively assumed to be the same in the basin fill as it is in the fractured rock. Accordingly, there would not be a substantial water-level decline in the basin fill material outside of the Tule Desert.

The only known current water well that taps basin-fill ground water in the Tule Desert is the Tule Well, which is capable of pumping approximately 8 gpm on demand. Given the distance of this well from the area where the project wells are likely to be located (that is, it is located more than 1.5 miles from where a project well would be located), together with

the small well yield and water demand associated with this well, it is unlikely that this well would be adversely affected by project pumping.

There are no current users of ground water from the fractured-rock aquifer in the Tule Desert. Consequently, no existing wells would be affected by the water level decline that would occur in the fractured-rock aquifer within the Tule Desert.

Because ground water in Virgin River Valley is a vital source of water to municipalities and agriculture in the region, the potential impacts of project pumping on this resource must be assessed thoroughly. Therefore, in addition to the drawdown analysis, presented above, which indicates that water level declines will be restricted to roughly 1.5 miles from the pumping wells, the conclusion that project pumping would not result in either substantial ground water level declines or a substantial loss of the ground water resource within the Virgin River Valley is further supported by the following factors:

- As presented in *Section 3.4.2.2.3, Aquifer Characteristics, of the Proposed Toquop Land Disposal Amendment to the Caliente MFP and FEIS for the Toquop Energy Project*, the available perennial yield in the lower Virgin River Valley is estimated by Dixon and Katzer (2002) to be approximately 40,000 afy, even after the current local pumping in the Virgin River Valley, reported to be about 12,000 afy, is taken into account. This estimate implies that even if the entire project demand were to be pumped directly from the lower Virgin River Valley, there would still be 33,000 afy of perennial yield available within the Virgin River Valley.
- The volume of ground water in storage in the uppermost 100 feet of saturated sediments in the Virgin River Valley is estimated to be close to 3 million acre-feet. This volume is more than 10 times the entire 42-year water demand of the project. A vast amount of ground water is, therefore, stored within the Virgin River Valley. Even in the absence of available perennial yield, this much water in storage effectively mitigates the extent of water level decline caused by local pumping. Consequently, even if the entire project demand were pumped directly from the Virgin River Valley, and not from the proposed location in the Tule Desert, the resulting water level decline in the Virgin River Valley could be controlled through the wellfield design such that no existing wells would be adversely affected. In other words, through optimizing the spacing of the wells, the water level decline associated with pumping 7,000 afy could be kept at levels that would not affect the water levels in existing production wells within the Virgin River Valley).

This conclusion is further supported by the results of two different analyses, the first being the results of the Tule Desert drawdown analysis discussed above. The Muddy Creek Formation is understood to be no more transmissive than the fractured-rock aquifer of the Tule Desert. Accordingly, a similar limited area of influence of a given pumping well in the Tule Desert should also occur in the Muddy Creek Formation (that is, drawdowns of no more than approximately half a foot at distances of roughly 1.5 miles from the pumping well).

Second, the results of a study of spatially concentrated pumping 10,000 afy from the Muddy Creek Formation in the vicinity of Halfway Wash indicates that drawdowns on

the order of 5 feet extend no more than 6 miles from the pumping center after 50 years (Las Valley Water District, 1992).

- Based on the generally southern direction of the hydraulic gradient of ground water in the Tule Desert fractured-rock, ground water inflow from the wellfield portion of Tule Desert into the Virgin River Valley occurs primarily west of Toquop Wash and downgradient of the current municipal production wells that serve the towns of Mesquite and Bunkerville. This implies that ground water intercepted by the project wells in the Tule Desert would not flow, in the absence of project pumping, toward existing Virgin River Valley wells. Project pumping, therefore, would not affect ground water flowing to existing Virgin River Valley wells, and water levels in these wells would similarly not be affected by the proposed project.
- A comparison of the C-14 data from the fractured-rock aquifer in the Tule Desert (PW-1) with the available data from municipal wells in the Virgin River Valley (Bunkerville 1 and 2, and Virgin Valley 5 and 25) clearly indicate that age of the ground water is significantly different between these two areas—implying a different source for each water type. Pumping in the Tule Desert, therefore, would not affect the existing municipal wells in the Virgin River Valley because they have independent sources.

Specifically, the value of C-14 at PW-1 (0.9 percent modern carbon) approaches the maximum age for using C-14 for dating purposes (approximately 40,000 to 50,000 years old).

Carbon-14 data from the municipal production wells in the Virgin River Valley reveal the following two related occurrences: 1) the ground water from the Virgin River Valley wells is younger than the ground water from PW-1 in the Tule Desert; and 2) the age of the ground water from the Virgin River Valley wells increases from east to west (that is, in a downstream direction along the Virgin River). Both of these observations support the occurrence of independent ground water flow paths between the proposed wellfield area in the Tule Desert and the existing municipal wells in the Virgin River Valley. Specifically, they reinforce the conclusions made above that ground water that currently flows beneath the Tule Desert enters the Virgin River Valley downstream of the Virgin Valley municipal wells.

With respect to the regional carbonate-aquifer system, the rate of ground water extraction for this project would be only a small fraction of the total capacity of the aquifer. Within the Colorado River Basin, the flow has been estimated to be approximately 200,000 afy. The project demand of approximately 7,000 afy is 3.5 percent of that amount. The Nevada State Engineer has approved 2,100 acre-feet of water per year of the Vidler Water Company—Lincoln County water right applications. Vidler Water Company—Lincoln County have an application for additional water adequate to operate the power plant. The application is being held aside pending results of additional hydrologic studies.

2. Commercial or Recreational Fisheries

No perennial water occurs within the Proposed Action to support a recreational or commercial fishery.

3. Other Water Related Recreation

No water-related recreational activities occur within the Proposed Action.

4. Aesthetics of the Aquatic Ecosystem

With the exception of Toquop Wash within Toquop Gap, the aesthetic value of the waters of the US within the Proposed Action is limited. All of the ephemeral washes within the Proposed Action, except for Toquop Wash, have little vegetation. Impacts to the stands of riparian vegetation within Toquop Wash can be minimized by refinements of the alignment during the final design of the pipeline, thus minimizing aesthetic affects.

No wetlands are present in the proposed project area.

5. Parks, National and Historic Monuments, National Seashores, Wild and Scenic Rivers, Wilderness Areas, Research Sites, Etc.

Because the Toquop parcels are not within designated Wilderness Areas, Wilderness Study Areas (WSAs), ACEC, or along a Wild and Scenic River, no impacts would occur. The potential wellfield abuts the Mormon Mountains WSA. Therefore, management prescriptions for those special management areas would not apply to any of the proposed project features, except for the proposed access road between I-15 and the southern Toquop parcel, which would cross the Mormon Mesa ACEC.

The proposed access road is an existing dirt road and would require improvement to construct and operate the Proposed Action in both the Lincoln and Clark County portions. Improvements would include road widening to 24 feet, straightening in certain locations, and paving the entire 14.4-mile length of the road. This would potentially affect 216 acres (137 acres in Lincoln County and 79 acres in Clark County) of previously undisturbed lands contained in the construction right-of-way and 20 acres of staging areas in Lincoln County. All of the staging areas and the Clark County portion of the access road are in the Mormon Mesa ACEC, while 123 acres of the previously undisturbed 137 acres in Lincoln County are in the Mormon Mesa ACEC. Following reclamation, the net new long-term disturbance would be 65 acres (42 acres in Lincoln County and 23 acres in Clark County). This ACEC is a desert tortoise Special Management Area (SMA).

The ACEC is a ROW avoidance area in both Lincoln and Clark Counties. However, this is an upgrade to an existing road and will meet ACEC requirements in Lincoln County according to stipulations contained in the Caliente Management Framework Plan that call for the use of existing roads for construction in ACECs and the avoidance of areas outside of corridors within ACECs. The project would also conform with the Las Vegas Resource Management Plan (RMP) as follows: RW-1-e identifies desert tortoise ACECs as right-of-way avoidance areas. Therefore, ACI a/2a applies to any new or change to an existing RW and states "Manage each area based on the specific resource constraints identified in Tables 2-2 through 2-6." Table 2-2 is specifically directed at resource constraints for the desert tortoise ACECs covered by the Las Vegas RMP, which include the Mormon Mesa ACEC. Table 2-2 states that the following resource constraints apply to roads in ACECs: "Require reclamation of temporary roads. Authorize new roads in response to specific proposed actions where no feasible alternative exists. Ensure access to private property." Therefore, the improvement of the existing graveled access road to the proposed power plant site

would be in conformance with the Las Vegas RMP, provided all resource constraints are enforced.

6. Traffic/Transportation Patterns

The Proposed Action project area is currently accessible to the public. With the exception of the energy plant site itself, areas currently accessible to the public will remain so. No new roads will be constructed outside of the Proposed Action. The access road into the site will be improved to facilitate construction of the energy facility and access for operation. Significant changes to traffic patterns are not anticipated.

7. Energy Consumption or Generation

The Western Systems Coordinating Council (WSCC) estimates a demand for approximately 11,300 MW of new power plant generation to be constructed in its region of the western United States over the next 10 years to maintain reliable operation of the transmission system. The Toquop project would provide much needed support to the overall energy supply in this region and contribute approximately 10 percent of the projected demand for new generation within the WSCC. Based on data available from the WSCC, the 2002 Operating Reserve Margin (the difference between available capacity, excluding transfers, and peak demand) for the Las Vegas area and the Arizona-New Mexico-Southern Nevada area is minus 2.9 percent. This indicates that the area relies on importing electricity to meet peak demands. This situation is the result of growth in the demand for electricity to serve a fast growing region. The proposed project would significantly strengthen the electric grid in the Las Vegas area, including the City of Mesquite, based on the flow of electric power on the existing transmission system.

8. Navigation

Not applicable. The ephemeral washes within the Proposed Action are usually dry and therefore not used for navigation.

9. Safety

The Proposed Action would not adversely impact safety of the general public or construction personnel. Construction would have to comply with applicable federal, state, and local safety standards. These safety standards would protect the general public that may access the project area during construction and the construction personnel would work on this project. After construction, the proposed project would not create any ongoing safety problem.

10. Air Quality

Section 4.6.1, Air Quality, of the Proposed Toquop Land Disposal Amendment to the Caliente MFP and FEIS for the Toquop Energy Project, presents a detailed evaluation of the Proposed Action's impacts to Air Quality. This evaluation is summarized below.

Construction Impacts

Various control measures would be used to minimize impact of construction-related emissions. Because of these measures to prevent fugitive dust and the minimum vehicle emissions, the potential impacts resulting from construction activities at the proposed site

would occur only over a limited geographic area and only for a limited time. After site preparation is complete, foundations have been constructed, and mitigation measures such as covering of traffic routes with gravel have been implemented, emissions would be very low. A Class II analysis, using the SCREEN3 dispersion model, demonstrates that federal and state ambient air quality standards would not be exceeded at any time during the construction phase. All predicted construction impacts are less than allowable standards.

Operational Impacts

To assess potential air quality impacts associated with operation of the facility, dispersion modeling was performed using EPA-approved air quality dispersion models, which are mathematical descriptions of atmospheric diffusion and dispersion processes that can be used to predict pollutant impacts over a given area. The modeling was conducted in accordance with a dispersion modeling protocol that was submitted to and approved by the NDEP BAQ as part of the PSD process. *Appendix E, Air Quality Dispersion Modeling Methodology*, of the *Proposed Toquop Land Disposal Amendment to the Caliente MFP and FEIS for the Toquop Energy Project*, describes the air quality dispersion modeling methodology in detail.

Dispersion modeling of the maximum allowable emissions from the Toquop facility was performed for NOX, CO, PM10, and SO2. No EPA-approved models exist for prediction of ozone impacts of a single facility.

Predicted impacts are compared to the “PSD Increment,” which is the maximum allowable ambient air quality deterioration allowed under the PSD program. They are also compared to the national ambient air quality standards (NAAQS). The NAAQS are the pollutant concentrations below which, as determined by the USEPA, no adverse human health or environmental impacts are presumed to occur. Nevada has specific state AAQS, but these generally match the federal standards.

Ambient impacts of hazardous air pollutant (HAP) emissions were estimated by prorating the ISCST3 and CTSCREEN modeling results for the criteria pollutants based on the ratios of HAP emission rate to criteria emission rate for each pollutant and each source. None of the estimated HAP concentrations exceed the available standards, based on the appropriate exposure term. Therefore, even if residences were located in close proximity to the site, it is very unlikely that the estimated HAP concentrations would result in an unacceptable risk to the occupants of those residences. The distance of the proposed Toquop facility from any residences or business makes this analysis even more conservative.

Evaluation of air emission impacts on Federal Class I areas is focused on two primary topics. First, maximum ambient concentrations of criteria pollutants are estimated and compared to Class I area ambient air quality standards and Class I area allowable increment. Second, impacts of air emissions on Air Quality Related Values (AQRVs) within the Class I area are determined. In the western United States, AQRV evaluation is typically limited to evaluation of impacts on regional haze and AQRV impacts caused by acid deposition.

A CALPUFF screening model was used to predict impacts on the Grand Canyon National Park. National Weather Service meteorological data from Las Vegas were used for this analysis. This is the nearest existing set of data.

Three additional Class I areas exist within 200 kilometers (125 miles) of the Proposed Action plant site. These are the Sycamore Canyon Wilderness Area, Bryce Canyon National Park, and Zion National Park. Because the distances to these areas are greater than the distance to the Grand Canyon National Park, the managers of these areas suggested that an analysis of potential impacts on the Grand Canyon National Park only would be adequate. Facility impacts on the Grand Canyon National Park should exceed impacts at the other three areas.

All predicted impacts are well below PSD Class I modeling significance levels; therefore, the Proposed Action is presumed to have an insignificant impact on air quality in the area and a cumulative evaluation of the impacts on increment and NAAQS was not performed.

The CALPUFF screening analysis predicted that the reasonable but conservative impact on regional haze within the Grand Canyon National Park was a 3.5 percent change in atmospheric light extinction. In accordance with the FLAG guidance document, a facility predicted to cause a change of 5 percent or less is presumed to have an insignificant impact on visibility. Therefore, a cumulative impact analysis of impacts on the Grand Canyon National Park was not performed. The subsequent complete CALPUFF analysis predicted that the reasonable but conservative impact on regional haze within the Grand Canyon National Park was a 1.6 percent change in atmospheric light extinction.

Reasonable but conservative modeling, based on CALPUFF screening analysis of the Proposed Action impact on acid deposition in the Grand Canyon National Park indicates that the added deposition would not exceed 1.3×10^{-3} kilograms per hectare per year (kg/ha/yr) for nitrogen compounds and 1.3×10^{-3} kg/ha/yr for sulfur. These results are significantly less than the deposition analysis thresholds of 5.0×10^{-3} kg/ha/yr for nitrogen recommended by the 2001 FLAG Guidance on Nitrogen Deposition Analysis Thresholds document and 5.0×10^{-3} kg/ha/yr for sulfur, as proposed but not yet finalized by the National Park Service (NPS). Because the estimated impacts of the Proposed Action were extremely low, the Proposed Action is presumed to create an insignificant increase in the total deposition for the Grand Canyon National Park. Therefore, a more complete analysis of existing plus proposed deposition compared to the acid neutralization capacity of the Grand Canyon National Park waters was not performed.

Class II Area Visibility Impacts

The NPS requested an analysis of visibility impacts within the Lake Mead National Recreation Area. This included a CALPUFF analysis of impacts on regional haze and a VISCREEN analysis of discrete plume visibility impacts.

Regional Haze Impacts

The regional haze CALPUFF screening analysis predicted a reasonable but conservative 2.1 percent change in atmospheric light extinction resulting from the Proposed Action. Because this is well below the 5 percent threshold recommended in the FLAG document, no cumulative impact analysis of Lake Mead National Recreation Area regional haze was performed.

Discrete Plume Impacts

The VISCREEN distribution model was used to assess discrete plume impacts. This model assumes all plant emissions would form a single plume. On this basis, the four combustion

turbine generator/duct burner stacks and the 16 cooling tower cells of the Proposed Action were modeled as a single plume blowing straight towards Lake Mead.

For the Proposed Action, based on the Las Vegas meteorological data set used for the CALPUFF analysis, this reasonable but conservative meteorology was determined to be a “D” class stability and a 4 m/s windspeed. These data were used for the VISCREEN analysis. No published standards exist for evaluation of discrete plume visual impacts in federal Class II areas. For federal Class I areas, the VISCREEN users’ manual suggests maximum allowable color contrast (“delta E”) of 2.0 for results viewed against terrain or sky, maximum allowable contrast of 0.5 for results viewed against sky, and maximum allowable contrast of 0.6 for results viewed against terrain.

For the Proposed Action, the model predicts that the reasonable but conservative color contrast and contrast, viewed against sky, would be 0.25 and -0.008, respectively, for situations where the observer is viewing the plume with the sun behind the observer, and 1.5 and 0.031, respectively, for situations where the observer is viewing the plume with the sun behind the plume. These results are well within the standards for Class I areas. The model predicts reasonable but conservative color contrast and contrast, viewed against terrain, of 0.083 and 0.01, respectively, with the sun behind the observer, and 2.3 and 0.015, respectively, with the sun behind the plume.

The model predicts that, under the right atmospheric conditions and with specific relative angles between the observer, the plume, and the sun, the total Proposed Action plant emissions merging to form a single plume could be viewed against terrain at Lake Mead National Recreation Area. Predicted results are well within Class I area standards for all other situations.

These conditions could occur, at most, for 1 percent of the year. Less than 1 percent of the Lake Mead National Recreation Area is within the radius where these results were predicted. Furthermore, at the specified angles of sun, observer, and terrain, no elevated terrain against which the observer could view the plume exists. Therefore, VISCREEN predicts minimal impact on visibility within the Lake Mead National Recreation Area.

11. Noise

Construction of the Proposed Action would result in a temporary (26-month) direct increase in ambient noise levels at the southern Toquop power plant site, along the access road to the site, at the wellfield, and along the western water pipeline alignment. The actual increase in ambient noise levels at any given location would depend on the construction activity occurring and the number and mix of construction vehicles and equipment in use.

Construction of a power plant can generally be divided into five phases that use different types of construction equipment. The five phases are: 1) site preparation and excavation; 2) concrete pouring; 3) steel erection; 4) mechanical; and 5) clean-up. Construction equipment generates both constant and impulse noise, depending on the type of equipment. Noise levels generated by construction equipment generally range from 85 to 98 dBA at 50 feet, and would vary, depending on the construction activity. Some blasting is anticipated during construction. The increased noise level (approximately 105 dBA at a distance of 1,000 feet) would have a duration of less than 2 seconds. These construction noise levels would be temporary, and noise levels at the source would not exceed 110 dBA.

No sensitive receptors would be exposed to the noise. Lincoln County's Zoning Ordinance does not include a noise ordinance (Lincoln County, 2001b).

Operation of the proposed power plant is expected to emit noise levels of approximately 60 dBA at approximately 550 feet over open land. No noise ordinances exist in Lincoln County, and no sensitive receptors would be exposed to the noise.

12. Historic Properties

Surface evaluation of the Proposed Action resulted in no paleontological resources.

Ten archaeological sites (eight prehistoric, two historic) and two isolated artifacts could be affected by construction or by change of ownership resulting from the proposed land exchange. All of these cultural resources are ineligible for the National Register of Historic Places (NRHP). Indirect impacts could potentially result from greater human activity in the area and possibly increased OHV use.

The BLM initiated consultation with several Southern Paiute tribes concerning both the initial land exchange proposal as well as the ensuing Toquop Energy Project. Several responding tribes made a site visit, and concerns were raised about possible effects to the Salt Song Trail, a property of traditional cultural or religious importance. Subsequently, among those tribes expressing initial concerns, one tribe indicated that this property does not extend into the project area, and another tribe indicated it has no concerns with the Proposed Action or its alternatives. Otherwise, BLM determined it had not received enough information about this property's location or its current use to assess possible project-related effects in relation to expressed concerns. No tribe has responded to BLM's request for more specific information about this property's location or possible effects on religious practitioners. Additional information on consultation is provided in *Section 5.3.2, Native American Consultation*, of the *Proposed Toquop Land Disposal Amendment to the Caliente MFP and FEIS for the Toquop Energy Project*.

No special consideration is necessary for ineligible cultural resources sites or isolated artifacts. The Proposed Action can therefore proceed with no requirements for avoidance or mitigation of historic properties.

The potential exists for buried cultural resources not visible on the surface survey, although the geomorphic context of the Proposed Action makes the presence of any such sites unlikely. This low probability of buried deposits precludes the need of archaeological monitors during construction.

Because only a records review has been conducted for the wellfield area, all well locations and associated new access routes must be subjected to a Class III survey prior to any construction, in accordance with terms of the Cultural Resources Programmatic Agreement (PA).

The PA provides specific procedures for handling discoveries during construction. The BLM will ensure that any human remains, grave goods, items of cultural patrimony, and sacred objects encountered during the undertaking are treated with the respect due such materials. In accordance with the terms of the PA, human remains and associated grave goods found on public land will be handled according to the provisions of the Native American Graves Protection and Repatriation Act (NAGPRA) and its implementing regulations (43 CFR 10).

13. Land Use Classification

The Proposed Action would not change land use classification.

14. Economics

Economic Impacts of Construction

The total estimated construction cost of the Proposed Action is approximately \$695 million, of which \$175 million would remain in the region of influence. The total annual estimated labor cost during construction is \$34 million, all of which would be spent within the region of influence. This construction labor estimate was provided by Toquop Energy and is based on the company's experience with similar projects.

Construction workers would be hired primarily from the local labor force. This includes workers from the Las Vegas metropolitan area; Mesquite and Overton, Nevada; and St. George, Utah. These workers are expected to commute daily to the project construction site. It is recognized that some construction workers may arrange for temporary residency (in rental homes or at recreational vehicle [RV] parks) in the Mesquite, Nevada, or the St. George, Utah, areas, which are relatively close to the project site. However, it is expected that the majority of construction workers would not choose to do so.

According to Toquop Energy, the Proposed Action would generate peak and average construction employment levels of 950 and 500 workers, respectively, in the combined Lincoln and Clark County area. Project construction is expected to last 26 months, and annual construction payroll is estimated at \$34 million. Although the unemployment rate in the region is not exceptionally high (the 2001 average was 7.2 percent in Lincoln County and 5.5 percent for Clark County), construction workers are expected to be hired from the local labor force. Thus, most construction workers would not relocate from other areas in the state or the country. Workers with specialized skills may be imported from other areas; however, this number is expected to be low when compared to the total number of construction workers required for construction of the Proposed Action.

Assuming an average annual direct construction employment level of 500 jobs, the resulting total employment generated would be about 875 jobs. This estimate is derived from the Type Social Accounting Matrix (SAM) employment multiplier of 1.75 for IMPLAN Sector 50: New Utility construction. The 875 jobs is the sum of the direct employment (500 jobs) and the indirect and induced employment of approximately 175 and 200 jobs, respectively. Indirect employment refers to the employment that is generated by the goods and services provided to construct and operate the Proposed Action. Induced employment refers to the employment generated by household spending, and includes the goods and services purchased by employees of the project.

Employment effects during the construction phase would be short-term because the jobs created would only last during the construction period. Although the effect of project construction on regional employment would be beneficial, it would increase employment in the region by less than 0.5 percent.

Earnings and Income

Toquop Energy has indicated that the construction of the Proposed Action, including the power plant, access road, and water pipeline would result in an annual construction payroll

of \$34 million. The combined Lincoln and Clark County region Type SAM labor income multiplier for IMPLAN Sector 50: New Utility Construction is 1.46, therefore, the construction activities would generate an additional \$16 million in indirect and induced labor income within the two- county region. The indirect and induced earnings were estimated to be approximately \$8 million each. Because only a small number of construction workers are expected to reside outside of the Clark/Lincoln County area, earnings and income in other areas are not expected to change.

Income that would be generated during the construction phase is considered short-term because the additional income to the region would only last during the construction period. The total income effect of \$50 million resulting from project construction would be beneficial, but not substantial, when compared to the two-county regional total personal income of \$29 billion.

Tax Receipts

Lincoln County would collect sales and use tax on all real property purchased and delivered to the project site at a combined rate of 6.75 percent (2 percent sales tax, 2.25 percent local school support tax, 0.5 percent basic city-county relief tax, 1.75 percent supplemental city-county relief tax, and 0.25 percent infrastructure). The construction cost of the Proposed Action is estimated at approximately \$695 million, of which approximately \$70 million would be construction payroll. Assuming 75 percent of the remaining construction cost is for goods and materials, sales and use taxes in the range of \$32 million would be generated from an estimated increase in taxable sales of about \$470 million.

Housing

It is expected that the labor supply in the Clark/Lincoln County area is large enough that construction workers would not need to relocate from outside the area to construct the Proposed Action. If specialized labor is required that cannot be obtained in Clark County or Lincoln County, the number of people expected to move to the Clark/Lincoln County area from other areas is expected to be low. Housing vacancy rates are about 8.5 percent for Clark County and 29.3 percent for Lincoln County based on the 2000 Census. Because it is likely that most construction workers would be local residents, demand for housing is not expected to change as a result of project construction, and the housing vacancy rate would not be affected.

If construction workers choose to reside in RV parks in Mesquite or Overton, Nevada, nine RV parks with approximately 800 RV sites are available. If they choose to reside in RV parks in the St. George, Utah, area, six RV parks with 920 sites are available. Therefore, an adequate number of RV spaces is expected to be available to construction workers during project construction.

Economic Impacts of Operation

Operation of the Proposed Action would result in indirect and induced economic impacts that would occur within the region of influence. These indirect and induced impacts represent permanent increases in the region's economy. The indirect and induced impacts would result from annual expenditures on payroll as well as those on operations and maintenance.

The total estimated annual operation cost of the Proposed Action is \$15.5 million, of which \$13 million is the fixed annual operating cost and \$2.5 million is annual payroll. All of these costs are expected to remain in the region of influence.

Population

Changes in the Clark/Lincoln County population as a result of operating the Proposed Action are not expected to occur from employment opportunities generated by the project. The operation workforce is very low (estimated at 25) and is expected to be hired from the local area.

Employment

The Proposed Action operational workforce is estimated to be 25. Operational personnel are expected to be hired from the local (Clark County and Lincoln County) workforce unless specialized expertise is required and the workers with specialized skills cannot be hired from the local area.

The 25 new jobs associated with the Proposed Action are anticipated to generate an additional 25 jobs within the two-county region. This estimate is based on the two-county region Type SAM employment multiplier of 2.03, associated with IMPLAN Sector 443: Electrical Services. Of the additional 25 additional jobs, 10 would be from indirect employment and 15 would be from induced employment. The 10 indirect jobs would be created in other industries as a result of operation of the plant by the 25 employees. The 15 induced jobs would result from the spending of earnings by the 35 people who would be employed at the 25 direct and 10 indirect jobs that would be created.

Employment effects during the operational phase would be permanent because the jobs created would remain throughout the life of the project. Although the 50 total additional jobs generated by the Proposed Action would be beneficial to the regional economy, the effect of project operation on regional employment would be minor relative to the 372,000 total employment reported for the two-county region of influence.

Unemployment

The total estimated number of jobs to be created in the Clark/Lincoln County area by project operation is 50. The creation of these jobs would not change the unemployment rate in the region.

Earnings and Income

Toquop Energy has indicated that the plant operation would have an annual payroll of \$2.5 million. Based on this direct increase in labor income, the project operation phase would result in a total increase in labor income within the two-county region of about \$3.7 million. This estimate is derived from the IMPLAN sector 433 labor income multiplier of 1.49. The indirect and induced earnings are estimated at approximately \$0.6 million each

Income that would be generated during the operational phase is considered permanent because the additional income to the Clark/Lincoln County region would remain throughout the life of the project. The income effect of \$3.7 million resulting from project operation would be beneficial, but not substantial, when compared to the \$29 billion total personal income level of the two-county region of influence.

Tax Receipts

Lincoln County would collect sales and use tax on all real property purchased and delivered to the project site at a combined rate of 6.75 percent. The annual fixed cost operating budget is anticipated to be approximately \$13 million, excluding the cost of natural gas. If the entire annual operating budget represented purchases subject to Lincoln County sales tax, this would represent a substantial increase for Lincoln County, which reported taxable sales of \$25.2 million for fiscal year 1999-2000. Of the 6.75 percent combined tax rate, 3 percent is collected and disbursed directly to the collecting county. This would represent an annual payment of approximately \$390,000 to Lincoln County, in addition to the county's portion of the revenue generated from the remaining 3.75 percent of the combined tax rate. This increase in sales tax receipts to Lincoln County would be a benefit. The additional sales tax revenue to Clark County would represent a minor benefit to Clark County.

According to Nevada Revised Statutes, if electricity is sold outside of Lincoln County, the project facilities would be centrally assessed in combination with any of the owners of other Nevada holdings associated with the generation and transmission of electricity (NRS 361.320). The estimated annual property tax attributed to the Proposed Action would be approximately \$7 million based on project capital cost (\$695 million), the assessment rate (35 percent), and the average property tax rate (3 percent). If the project is centrally assessed, the disbursement of this tax to Lincoln County and Clark County would be governed by rules established by the Nevada Tax Commission and would depend on various factors that are unknown at this time. However, any increase in property taxes that would accrue to Lincoln County would be a benefit because the county's relatively small tax base (the 1999-2000 total property tax collection was projected to be \$2.3 million). Additional tax revenues from the Proposed Action to Clark County would be minor, relative to the property taxes collected in Clark County.

As discussed previously, Washoe County's property tax revenues would decrease because of the transfer of the Pah Rah parcel from private ownership to federal (BLM) jurisdiction, and Lincoln County's property tax revenues would increase because of the Toquop parcel (either the southern or northern parcel) being transferred from federal (BLM) jurisdiction to private ownership.

Other Income

Water rights that would be required to supply up to 7,000 acre-feet of water per year from the Tule Desert wellfield necessary to operate the Toquop Energy Project have been jointly applied for by Vidler Water Company, Inc. (a sister company of NLRC) and Lincoln County. Toquop Energy would lease and use these water rights for the 42-year life of the project. Lincoln County's estimated share of the leased water is up to \$9 million over the life of the project.

15. Prime and Unique Farmland (7 CFR Part 658)

Not applicable. No prime or unique farmland would be impacted by the Proposed Action.

16. Food and Fiber Production

Not applicable. No food or fiber production facilities and no agricultural lands would be impacted by the Proposed Action.

17. General Water Quality

The proposed activity would not adversely impact water quality.

18. Mineral Needs

Not applicable. No mineral or aggregate extraction, processing or sales would be adversely impacted by the Proposed Action.

19. Consideration of Private Property

No relocation of business or residences would be required for the proposed activity. The Proposed Action would occur within land that is currently owned by the Bureau of Land Management.

20. Conservation

The proposed activity would not impact any existing plans for resource or habitat conservation.

21. Other

D. Other Anticipated Changes to Non-Jurisdictional Areas that have Been Determined to be Within the Corps' NEPA Scope of Analysis

There are no anticipated changes to non-jurisdictional areas that have been determined to be within the Corps' scope of analysis.

E. Summary of Indirect and Cumulative Effects from the Proposed Permit Action

During construction, dust and other construction-related disturbances may directly and indirectly affect plants and wildlife. Construction may possibly fragment existing habitat use patterns, leading to a reduction in quality of habitat adjacent to new construction.

Minor impacts have previously occurred to the ephemeral washes present within and adjacent to the area of the Proposed Action. These minor impacts are associated with the construction of the roadway and powerlines. No reasonably foreseeable actions, such as development or additional roadway construction, are anticipated to occur within the immediate vicinity of the project area, thus cumulative impacts are not expected.

F. Other Cumulative Effects Not Related to the Proposed Permit Action

1. Occurred On-Site Historically

Minor impacts have previously occurred to the ephemeral washes present within and adjacent to the area of the Proposed Action. These impacts are associated with the existing access road as well as utility line corridors present in the general vicinity.

2. Likely to Occur within the Foreseeable Future

No changes to the site within the foreseeable future were identified.

3. Contextual Relationship between the Proposed Action and (1) and (2) Above

The Proposed Action would not impact the existing use of the site. The project would not change planned development within or adjacent to the project area.

G. Mitigation Proposed by Applicant

1. Avoidance, Minimization, Compensation Sequence

a. Avoidance

Several alternatives to the Proposed Action were evaluated. The No Action Alternative would not meet the project purpose and need. Under Alternative 1, the total length of the water pipeline would be 12.6 miles, or 0.1 mile longer than the more westerly route described for the Proposed Action. This route would require crossing Toquop Wash at a wider point than for the Proposed Action. The proposed alternative pipeline alignment also would affect approximately 54 ephemeral washes, whereas the water pipeline for the Proposed Action would affect approximately 10 ephemeral washes.

Under Alternative 2, the construction of 12.0 miles of buried natural gas pipeline to bring fuel to the site, and 12.0 miles of an overhead electric transmission interconnection to carry net power production to the Navajo-McCullough Electric Transmission Line would be required. Constructing an additional 12.2 miles of access road would be required to reach the plant site under Alternative 2. Under this alternative, the proposed access road would impact approximately 83 ephemeral washes; including Halfway Wash, Toquop Wash and Sam's Camp Wash; that either intersect or parallel the proposed roadway. The proposed utility line would affect approximately 54 ephemeral washes, including Toquop Wash and Sam's Camp Wash. These washes also would be affected by portions of the proposed access road.

The impacts associated with Alternative 3 would be the same as for the Proposed Action.

The Proposed Action has the smallest area of permanent impacts to waters of the United States, and at the same time avoids impacts to the desert tortoise critical habitat present north of the Proposed Action plant site.

b. Minimization

To minimize unavoidable impacts to jurisdictional waters, construction activities with jurisdictional waters will be confined to the smallest area practicable.

The width of the fill within the access road will be limited to the minimum necessary for the crossing of waters of the United States. The access road will not cause more than minimal changes to the hydraulic flow characteristics of the stream, and each crossing will be culverted to allow normal flow during rain events.

Following construction, the proposed pipeline right-of-way will be restored to pre-construction contours. The pipeline alignment within Toquop Gap will be refined during the final engineering design phase to specifically minimize impacts to areas of riparian vegetation within the Gap

Appendix B, Standard Construction and Operation Procedures, of the Proposed Toquop Land Disposal Amendment to the Caliente MFP and FEIS for the Toquop Energy Project, contains measures to prevent or minimize the impacts to waters of the United States.

Construction activities will be conducted in accordance with a Stormwater Pollution Prevention Plan to be prepared for the project. Measures to minimize sedimentation and erosion will include best management practices such as check dams, silt fencing, and straw bales. The sediment and erosion control measures will be maintained throughout the course of construction. The sediment and erosion control measures will be located to protect downstream areas from construction impacts during periods of water flow in the project area.

Access roads and construction staging areas will be designed to allow normal flows to pass unimpeded. There will be no significant change to the hydraulic conditions of the upstream waters during construction activities.

2. Is Mitigation Used to Reduce any Impact to Below Significance?

No mitigation is proposed.

TABLE 1

Summary of Waters of United States Observed Within the Proposed Action and Alternative 3

Wash Designation	Wash Width (feet)	Intersects Road	Parallels Road	Latitude	Longitude	Approx. Milepost	Permanent or Temporary Impact	Approximate Impact (acres)	Comments
Waters of United States Present in Immediate Vicinity of Proposed Access Road Between I-15 and Plant Site									
R-1	10	N	Y	36°46.754N	114°13.742W	0.3-0.8	Permanent	0.013	Wash located on west side of road, narrows from 10 feet to 4 feet in width. Approximately 40 feet from road at MP 0.3. At MP 0.9 wash is at edge of road and is 4 feet wide. If impacted on west side area of impact estimated to be 150 feet by 4 feet.
R-2	6	Y	Y	—	—	1.0	Permanent	0.007	Wash arises from roadside drainage, then flows east. Area of impact is approximately 50 feet in length and 6 feet width.
R-3	12	Y	N	36°49.288N	114°17.844W	3.2	Permanent	0.01	Existing single 36-inch culvert. Wash approximately 12 feet wide and potential impact may extend approximately 50 feet on western side of road. In Realignment Area #1.
R-4	4	Y	N	—	—	4.4	Permanent	0.06	Located within Realignment Area #3. Roadway cross section estimated to be 700 feet wide.
R-5	6	Y	N	36°50.220N	114°18.062W	4.5	Permanent	0.006	Existing single 12-inch culvert. Wash approximately 6 feet wide.
R-6	3	Y	N	36°50.311N	114°18.332W	4.7	Permanent	0.003	Existing single 24-inch culvert. Wash approximately 3 feet wide.
R-7	10	Y	N	36°51.445N	114°18.480W	6.0	Permanent	0.01	Single 36-inch culvert. Wash varies from 5 to 10 feet in width.
R-8	2	Y	N	36°51.486N	114°18.445W	6.5	Permanent	0.002	Single 24-inch culvert. Two small 1-foot washes converge.
R-9	10 to 20	N	Y	36°51.486N	114°18.481W	6.5-6.6	None	0	Wash located west of and near base of roadway and parallels road—road could be widened to the east to avoid impacts.

TABLE 1
Summary of Waters of United States Observed Within the Proposed Action and Alternative 3

Wash Designation	Wash Width (feet)	Intersects Road	Parallels Road	Latitude	Longitude	Approx. Milepost	Permanent or Temporary Impact	Approximate Impact (acres)	Comments
R-10	3	Y	N	36°52.407N	114°17.411W	7.8	Permanent	0.003	Existing culvert, wooden culvert marker 7-7/10. Flows west to wash. In Realignment Area #5.
R-11	20	N	Y	36°52.689N	114°17.072W	8.2	None	0	Wash parallels road on west side. Wash width varies from 15 to 20 feet wide; approximately 10 feet from road. In Realignment Area #5.
R-12	25	Y	N	36°52.840N	114°16.674W	8.7	Permanent	0.03	Existing three 36-inch culverts, wash approximately 25 feet wide. In Realignment Area #5.
R-13	15	Y	N	36°52.905N	114°16.657W	8.8	Permanent	0.02	Two 36-inch culverts, wash approximately 15 feet wide. In Realignment Area #5.
R-14	4	Y	N	36°53.097N	114°16.285W	9.2	Permanent	0.004	Existing 24-inch culvert, wooden culvert marker 9-1/10. Wash approximately 4 feet wide.
R-15	6	Y	N	36°53.459N	114°16.058W	9.7	Permanent	0.006	Existing double 36-inch culverts, wooden culvert marker 9-5/10. Wash width between 4 and 6 feet.
R-16	6	Y	N	36°53.499N	114°16.033W	9.7	Permanent	0.006	Existing single culvert, wash approximately 6 feet wide.
R-17	10	Y	N	36°53.660N	114°16.029W	10.0	Permanent	0.01	Existing single 36-inch culvert, wooden culvert marker 9-7/10. Wash width approximately 10 feet. In Realignment Area #6.
R-18	6	Y	N	36°53.856N	114°15.932W	10.4	Permanent	0.006	No culvert—wash width varies between 1 and 6 feet.
R-19	6	Y	N	36°53.893N	114°15.932W	10.4	Permanent	0.006	No existing culvert. In Realignment Area #7.
R-20	6	Y	N	36°54.040N	114°15.975W	10.6	Permanent	0.006	No existing culvert.

TABLE 1
Summary of Waters of United States Observed Within the Proposed Action and Alternative 3

Wash Designation	Wash Width (feet)	Intersects Road	Parallels Road	Latitude	Longitude	Approx. Milepost	Permanent or Temporary Impact	Approximate Impact (acres)	Comments
R-21	8	Y	N	36°54.109N	114°15.789W	10.8	Permanent	0.008	No existing culvert. In Realignment Area #8.
R-22	4	Y	N	36°54.272N	114°15.590W	11.1	Permanent	0.004	No existing culvert. In Realignment Area #8 and 9.
R-23	15	Y	N	36°54.403N	114°15.466W	11.3	Permanent	0.02	No existing culvert. In Realignment Area #9.
R-24	6	Y	N	36°54.444N	114°15.400W	11.4	Permanent	0.006	No culvert, wash consists of two small channels. Incised, gravel channels. In Realignment Area #9.
R-25	4	Y	N	36°54.568N	114°15.382W	11.6	Permanent	0.004	No existing culvert. In Realignment Area #10.
R-26	2	Y	N	36°54.626N	114°15.381W	11.7	Permanent	0.002	No existing culvert. In Realignment Area #10.
R-27	2	N	N	36°54.662N	114°15.381W	11.8	Permanent	0.002	Wash only on east side of road, but does not parallel road. In Realignment Area #10.
R-28	4	Y	N	36°54.742N	114°15.025W	11.9	Permanent	0.004	No existing culvert. In Realignment Area #10.
R-29	2	N	N	36°54.872N	114°15. W	12.1	Permanent	0.002	Wash only on east side of road, but does not parallel road.
R-30	2	N	N	36°54.958N	114°15. W	12.2	Permanent	0.002	Wash only on east side of road, but does not parallel road.
R-31	6	Y	N	36°54.998N	114°15.708W	12.3	Permanent	0.006	Wash on west side, then drains into road. In Realignment Area #11.
R-32	20	Y	N	36°55.012N	114°14.652W	12.4	Permanent	0.04	Two washes next to each other, both are 20 feet wide. In Realignment Area #11.
R-33	10	Y	N	36°55.094N	114°14. W	12.5	Permanent	0.01	No existing culvert; gravel substrate. In Realignment Area #11.

TABLE 1

Summary of Waters of United States Observed Within the Proposed Action and Alternative 3

Wash Designation	Wash Width (feet)	Intersects Road	Parallels Road	Latitude	Longitude	Approx. Milepost	Permanent or Temporary Impact	Approximate Impact (acres)	Comments
R-34	1	Y	N	36°55.471N	114°14.156W	13.1	Permanent	0.001	No existing culvert. In Realignment Area #12.
R-35	1	N	Y	36°55.730N	114°13.851W	13.5	Permanent	0.001	Wash only on east side of road, but does not parallel road. In Realignment Area #12.
R-36	3	Y	N	36°55.937N	114°13.707W	13.8	Permanent	0.003	Parallels road, then crosses road. No existing culvert. Same wash as Wash A on Plant Site.
R-37	2	Y	N	36°56.027N	114°13.522W	14.1	Permanent	0.002	No existing culvert, near southern edge of plant site. In Realignment Area #13. Same wash as Wash B on Plant Site.
R-38	6	Y	N	36°56.287N	114°13.673W		Permanent	0.006	No existing culvert.
Total Impact:								0.331	

Notes:

- Waters of United States are numbered sequentially from south to north.
- Approximate latitude and longitude of Waters of United States were estimated using a hand-held global positioning unit, and have not been differentially corrected. GPS unit inoperable at some locations.
- Delineations of Waters of United States were approved during a site visit with Grady McNure/USACE on November 14, 2002.
- Approximate roadway Milepost increases from south to north along existing track road and is based on auto odometer. Odometer set to 0.0 at end of existing pavement.
- Unless otherwise noted, calculation of approximate area of impact based on proposed typical roadway cross-section width of 45 feet.
- Realignment Areas drawings dated November 1, 2002.

TABLE 1

Summary of Waters of United States Observed Within the Proposed Action and Alternative 3

Wash Designation	Wash Width (feet)	Intersects Plant Site	Parallels Plant Site	Latitude	Longitude	Approx. Milepost	Permanent or Temporary Impact	Approximate Impact (acres)	Comments
Waters of United States Present in Immediate Vicinity of Proposed Plant Site									
Wash A	8	Y	N	—	—	NA	Permanent	0	Same wash as Wash 36 along road alignment.
Wash B	8	Y	N	36°56.207N	114°13.854W	NA	Permanent	0.33	Length of impact within wash estimated to be 1,800 feet. Same wash as Wash 37 along road alignment.
Total Impact:								0.33	

Notes :

- Waters of United States are numbered sequentially from south to north.
- Approximate latitude and longitude of Waters of United States were estimated using a hand-held global positioning unit, and have not been differentially corrected. GPS unit inoperable at some locations.
- Delineations of Waters of United States were approved during a site visit with Grady McNure/USACE on November 14, 2002.
- Calculation of approximate area of impact based on Plan View of Plant Site, Map 2-4 from EIS.
- Realignment Areas drawings dated November 1, 2002.

TABLE 1

Summary of Waters of United States Observed Within the Proposed Action and Alternative 3

Wash Designation	Wash Width (feet)	Intersects Pipeline	Parallels Pipeline	Latitude	Longitude	Approx. Milepost	Permanent or Temporary Impacts	Approximate Impact (acres)	Comments
Waters of United States Present In Immediate Vicinity of Proposed Water Line									
P-1	5	Y	N	—	—	NA	Temporary	0.007	
P-2	10	Y	N	36°59.918N	114°16.159W	NA	Temporary	0.014	South Fork Toquop Wash.
P-3	6	Y	N	36°59.902N	114°16.419W	NA	Temporary	0.008	
P-4	2	Y	N	37°00.148N	114°16.575W	NA	Temporary	0.003	
P-5	4	Y	N	37°00.174N	114°16.593W	NA	Temporary	0.006	First wash on east side of Toquop Gap.
P-6	25-50	Y	Y	—	—	NA	Temporary	2.750	Toquop Wash, within Toquop Gap. Pipeline alignment parallels and intersects wash throughout Gap. Estimated impact of approximately 2,000 linear feet within wash.
P-7	20	Y	N	37°03.905N	114°18.026W	NA	Temporary	0.028	First wash on west side of Toquop Gap. Point at survey stake 2327.
P-8	6	Y	N	37°04.069N	114°17.969W	NA	Temporary	0.008	Parallels pipeline for approximately 60 feet. At survey stake 2334.
P-9	1	N	Y	37°04.231N	114°17.911W	NA	Temporary	0.001	Near survey stake 2340.
P-10	3	Y	N	37°04.384N	114°17.853W	NA	Temporary	0.004	Sam's Camp Wash. Near survey stake 2346.
Total Impact:								2.829	

Notes:

- Waters of United States are numbered sequentially from south to north.
- Approximate latitude and longitude of Waters of United States were estimated using a hand-held global positioning unit, and have not been differentially corrected. GPS unit inoperable at some locations.
- Delineations of Waters of United States were not specifically reviewed during a site visit with Grady McNure/USACE on November 14, 2002. However, Mr. McNure did review limits of jurisdiction within Toquop Gap.
- Calculation of approximate area of impact based on construction right-of-way width of 60 feet.

TABLE 2
Summary of Waters of United States Observed Within Alternative 1

Wash Designation	Wash Width (feet)	Intersects Road	Parallels Road	Latitude	Longitude	Approx. Milepost	Permanent or Temporary Impact	Approximate Impact (acres)	Comments
Waters of United States Present in Immediate Vicinity of Proposed Access Road Between I-15 and Plant Site									
R-1	10	N	Y	36°46.754N	114°13.742W	0.3-0.8	Permanent	0.013	Wash located on west side of road, narrows from 10 feet to 4 feet in width. Approximately 40 feet from road at MP 0.3. At MP 0.9 wash is at edge of road and is 4 feet wide. If impacted on west side area of impact estimated to be 150 feet by 4 feet.
R-2	6	Y	Y	—	—	1.0	Permanent	0.007	Wash arises from roadside drainage, then flows east. Area of impact is approximately 50 feet in length and 6 feet width.
R-3	12	Y	N	36°49.288N	114°17.844W	3.2	Permanent	0.01	Existing single 36-inch culvert. Wash approximately 12 feet wide and potential impact may extend approximately 50 feet on western side of road. In Realignment Area #1.
R-4	4	Y	N	—	—	4.4	Permanent	0.06	Located within Realignment Area #3. Roadway cross section estimated to be 700 feet wide.
R-5	6	Y	N	36°50.220N	114°18.062W	4.5	Permanent	0.006	Existing single 12-inch culvert. Wash approximately 6 feet wide.
R-6	3	Y	N	36°50.311N	114°18.332W	4.7	Permanent	0.003	Existing single 24-inch culvert. Wash approximately 3 feet wide.
R-7	10	Y	N	36°51.445N	114°18.480W	6.0	Permanent	0.01	Single 36-inch culvert. Wash varies from 5 to 10 feet in width.
R-8	2	Y	N	36°51.486N	114°18.445W	6.5	Permanent	0.002	Single 24-inch culvert. Two small 1-foot washes converge.

TABLE 2
Summary of Waters of United States Observed Within Alternative 1

Wash Designation	Wash Width (feet)	Intersects Road	Parallels Road	Latitude	Longitude	Approx. Milepost	Permanent or Temporary Impact	Approximate Impact (acres)	Comments
R-9	10 to 20	N	Y	36°51.486N	114°18.481W	6.5-6.6	None	0	Wash located west of and near base of roadway and parallels road—road could be widened to the east to avoid impacts.
R-10	3	Y	N	36°52.407N	114°17.411W	7.8	Permanent	0.003	Existing culvert, wooden culvert marker 7-7/10. Flows west to wash. In Realignment Area #5.
R-11	20	N	Y	36°52.689N	114°17.072W	8.2	None	0	Wash parallels road on west side. Wash width varies from 15 to 20 feet wide; approximately 10 feet from road. In Realignment Area #5.
R-12	25	Y	N	36°52.840N	114°16.674W	8.7	Permanent	0.03	Existing three 36-inch culverts, wash approximately 25 feet wide. In Realignment Area #5.
R-13	15	Y	N	36°52.905N	114°16.657W	8.8	Permanent	0.02	Two 36-inch culverts, wash approximately 15 feet wide. In Realignment Area #5.
R-14	4	Y	N	36°53.097N	114°16.285W	9.2	Permanent	0.004	Existing 24-inch culvert, wooden culvert marker 9-1/10. Wash approximately 4 feet wide.
R-15	6	Y	N	36°53.459N	114°16.058W	9.7	Permanent	0.006	Existing double 36-inch culverts, wooden culvert marker 9-5/10. Wash width between 4 and 6 feet.
R-16	6	Y	N	36°53.499N	114°16.033W	9.7	Permanent	0.006	Existing single culvert, wash approximately 6 feet wide.
R-17	10	Y	N	36°53.660N	114°16.029W	10.0	Permanent	0.01	Existing single 36-inch culvert, wooden culvert marker 9-7/10. Wash width approximately 10 feet. In Realignment Area #6.
R-18	6	Y	N	36°53.856N	114°15.932W	10.4	Permanent	0.006	No culvert—wash width varies between 1 and 6 feet.

TABLE 2
Summary of Waters of United States Observed Within Alternative 1

Wash Designation	Wash Width (feet)	Intersects Road	Parallels Road	Latitude	Longitude	Approx. Milepost	Permanent or Temporary Impact	Approximate Impact (acres)	Comments
R-19	6	Y	N	36°53.893N	114°15.932W	10.4	Permanent	0.006	No existing culvert. In Realignment Area #7.
R-20	6	Y	N	36°54.040N	114°15.975W	10.6	Permanent	0.006	No existing culvert.
R-21	8	Y	N	36°54.109N	114°15.789W	10.8	Permanent	0.008	No existing culvert. In Realignment Area #8.
R-22	4	Y	N	36°54.272N	114°15.590W	11.1	Permanent	0.004	No existing culvert. In Realignment Area #8 and 9.
R-23	15	Y	N	36°54.403N	114°15.466W	11.3	Permanent	0.02	No existing culvert. In Realignment Area #9.
R-24	6	Y	N	36°54.444N	114°15.400W	11.4	Permanent	0.006	No culvert, wash consists of two small channels. Incised, gravel channels. In Realignment Area #9.
R-25	4	Y	N	36°54.568N	114°15.382W	11.6	Permanent	0.004	No existing culvert. In Realignment Area #10.
R-26	2	Y	N	36°54.626N	114°15.381W	11.7	Permanent	0.002	No existing culvert. In Realignment Area #10.
R-27	2	N	N	36°54.662N	114°15.381W	11.8	Permanent	0.002	Wash only on east side of road, but does not parallel road. In Realignment Area #10.
R-28	4	Y	N	36°54.742N	114°15.025W	11.9	Permanent	0.004	No existing culvert. In Realignment Area #10.
R-29	2	N	N	36°54.872N	114°15. W	12.1	Permanent	0.002	Wash only on east side of road, but does not parallel road.
R-30	2	N	N	36°54.958N	114°15. W	12.2	Permanent	0.002	Wash only on east side of road, but does not parallel road.
R-31	6	Y	N	36°54.998N	114°15.708W	12.3	Permanent	0.006	Wash on west side, then drains into road. In Realignment Area #11.

TABLE 2
Summary of Waters of United States Observed Within Alternative 1

Wash Designation	Wash Width (feet)	Intersects Road	Parallels Road	Latitude	Longitude	Approx. Milepost	Permanent or Temporary Impact	Approximate Impact (acres)	Comments
R-32	20	Y	N	36°55.012N	114°14.652W	12.4	Permanent	0.04	Two washes next to each other, both are 20 feet wide. In Realignment Area #11.
R-33	10	Y	N	36°55.094N	114°14. W	12.5	Permanent	0.01	No existing culvert; gravel substrate. In Realignment Area #11.
R-+4	1	Y	N	36°55.471N	114°14.156W	13.1	Permanent	0.001	No existing culvert. In Realignment Area #12.
R-35	1	N	Y	36°55.730N	114°13.851W	13.5	Permanent	0.001	Wash only on east side of road, but does not parallel road. In Realignment Area #12.
R-36	3	Y	N	36°55.937N	114°13.707W	13.8	Permanent	0.003	Parallels road, then crosses road. No existing culvert. Same wash as Wash A on Plant Site.
R-37	2	Y	N	36°56.027N	114°13.522W	14.1	Permanent	0.002	No existing culvert, near southern edge of plant site. In Realignment Area #13. Same wash as Wash B on Plant Site.
R-38	6	Y	N	36°56.287N	114°13.673W		Permanent	0.006	No existing culvert.
Total Impact:								0.331	

Notes:

- Waters of United States are numbered sequentially from south to north.
- Approximate latitude and longitude of Waters of United States were estimated using a hand-held global positioning unit, and have not been differentially corrected. GPS unit inoperable at some locations.
- Delineations of Waters of United States were approved during a site visit with Grady McNure/USACE on November 14, 2002.
- Approximate roadway Milepost increases from south to north along existing track road and is based on auto odometer. Odometer set to 0.0 at end of existing pavement.
- Unless otherwise noted, calculation of approximate area of impact based on proposed typical roadway cross-section width of 45 feet.
- Realignment Areas drawings dated November 1, 2002.

TABLE 2
Summary of Waters of United States Observed Within Alternative 1

Wash Designation	Wash Width (feet)	Intersects Plant Site	Parallels Plant Site	Latitude	Longitude	Approx. Milepost	Permanent or Temporary Impact	Approximate Impact (acres)	Comments
Waters of United States Present in Immediate Vicinity of Proposed Plant Site									
Wash A	8	Y	N	—	—	NA	Permanent	0	Same wash as Wash 36 along road alignment.
Wash B	8	Y	N	36°56.207N	114°13.854W	NA	Permanent	0.33	Length of impact within wash estimated to be 1,800 feet. Same wash as Wash 37 along road alignment.
Total Impact:								0.33	

Notes:

- Waters of United States are numbered sequentially from south to north.
- Approximate latitude and longitude of Waters of United States were estimated using a hand-held global positioning unit, and have not been differentially corrected. GPS unit inoperable at some locations.
- Delineations of Waters of United States were approved during a site visit with Grady McNure/USACE on November 14, 2002.
- Calculation of approximate area of impact based on Plan View of Plant Site, Map 2-4 from EIS.
- Realignment Areas drawings dated November 1, 2002.

TABLE 2
Summary of Waters of United States Observed Within Alternative 1

Wash Designation	Wash Width (feet)	Intersects Pipeline	Parallels Pipeline	Latitude	Longitude	Approx. Milepost	Permanent or Temporary Impacts	Approximate Impact (acres)	Comments
Waters of United States Present In Immediate Vicinity of Proposed Water Line									
P-1	3	Y	N	36°56.364N	114°13.742W	NA	Temporary	0.004	
P-2	4	Y	N	36°56.543N	114°13.623W	NA	Temporary	0.006	
P-3	2	Y	N	36°56.854N	114°13.413W	NA	Temporary	0.003	
P-4	2	Y	N	36°56.885N	114°13.397W	NA	Temporary	0.003	
P-5	3	Y	N	36°56.987N	114°13.324W	NA	Temporary	0.004	
P-6	5	Y	N	36°57.004N	114°13.318W	NA	Temporary	0.007	
P-7	5	Y	N	36°58.421N	114.13.098 West	NA	Temporary	0.007	
P-8	3	Y	N	36°58.249N	114.13.101 West	NA	Temporary	0.004	
P-9	2	Y	N	36°58.068N	114.13.098 West	NA	Temporary	0.003	
P-10	3	Y	N	36°58.018N	114.13.101 West	NA	Temporary	0.004	
P-11	10	Y	N	36°57.953N	114.13.102 West	NA	Temporary	0.014	
P-12	2	Y	N	36°57.920N	114.13.102 West	NA	Temporary	0.003	
P-13	6	Y	N	36°57.864N	114.13.100 West	NA	Temporary	0.008	
P-14	2	Y	N	36°57.845N	114.13.102 West	NA	Temporary	0.003	
P-15	2	Y	N	36°57.832N	114.13.101 West	NA	Temporary	0.003	

TABLE 2
Summary of Waters of United States Observed Within Alternative 1

Wash Designation	Wash Width (feet)	Intersects Pipeline	Parallels Pipeline	Latitude	Longitude	Approx. Milepost	Permanent or Temporary Impacts	Approximate Impact (acres)	Comments
P-16	2	Y	N	36°57.805N	114°13.099 West	NA	Temporary	0.003	
P-17	5	Y	N	36°57.707N	114°13.103 West	NA	Temporary	0.007	
P-18	2	Y	N	37°00.116N	114°13.637W	NA	Temporary	0.003	
P-19	2	Y	N	37°00.116N	114°13.637W	NA	Temporary	0.003	Approximately 25 feet from Wash 21.
P-20	4	Y	Y	37°00.250N	114°13.894W	NA	Temporary	0.006	
P-21	2	Y	N	37°00.447N	114°13.929W	NA	Temporary	0.003	
P-22	2	Y	Y	37°01.029N	114°14.236W	NA	Temporary	0.003	One wash on each side of road, each 2 feet wide.
P-23	1	Y	N	37°01.454N	114°14.236W	NA	Temporary	0.001	
P-24	1	Y	N	37°01.494N	114°14.398W	NA	Temporary	0.001	
P-25	6	Y	N	37°01.578N	114°14.433W	NA	Temporary	0.008	
P-26	3	Y	Y	37°01.612N	114°14.434W	NA	Temporary	0.004	Between survey stakes 1251 and 1252.
P-27	1	Y	Y	37°01.720N	114°14.449W	NA	Temporary	0.001	Wash on east side only, flows into road.
P-28	3	Y	Y	37°01.881N	114°14.495W	NA	Temporary	0.004	Road would impact wash, but pipeline would not.
P-29	3	Y	N	37°02.090N	114°14.871W	NA	Temporary	0.004	
P-30	2	Y	Y	37°02.145N	114°14.900W	NA	Temporary	0.003	Desert tortoise in burrow noted near this location.
P-31	10	Y	N	37°02.387N	114°14.799W	NA	Temporary	0.014	
P-32	10	Y	N	37°02.531N	114°14.781W	NA	Temporary	0.014	
P-33	15	Y	N	37°02.687N	114°14.781W	NA	Temporary	0.021	Three washes converge at road.

TABLE 2
Summary of Waters of United States Observed Within Alternative 1

Wash Designation	Wash Width (feet)	Intersects Pipeline	Parallels Pipeline	Latitude	Longitude	Approx. Milepost	Permanent or Temporary Impacts	Approximate Impact (acres)	Comments
P-34	8	Y	Y	37°02.743N	114°14.803W	NA	Temporary	0.011	Several washes converge at road.
P-35	3	Y	N	37°02.816N	114°14.842W	NA	Temporary	0.004	
P-36	2	Y	N	37°02.842N	114°14.869W	NA	Temporary	0.003	
P-37	2	Y	N	37°03.005N	114°14.876W	NA	Temporary	0.003	
P-38	15	Y	N	37°03.179N	114°14.892W	NA	Temporary	0.021	
P-39	2	Y	N	37°03.592N	114°15.082W	NA	Temporary	0.003	
P-40	1	Y	N	37°03.684N	114°15.153W	NA	Temporary	0.001	
P-41	10	Y	N	37°03.744N	114°15.216W	NA	Temporary	0.014	
P-42	1	Y	N	37°03.800N	114°15.249W	NA	Temporary	0.001	
P-43	10	Y	N	37°03.849N	114°15.309W	NA	Temporary	0.014	
P-44	5	Y	N	37°03.923N	114°15.389W	NA	Temporary	0.007	2 channels 15 feet apart that cross road, see next entry.
P-45	5	Y	Y	37°03.980N	114°15.443W	NA	Temporary	0.007	
P-46	3	Y	N	37°04.040N	114°15.493W	NA	Temporary	0.004	2 channels 15 feet apart that cross road, see previous entry.
P-47	3	Y	N	37°04.040N	114°15.493W	NA	Temporary	0.004	
P-48	3	Y	N	37°04.334N	114°15.800W	NA	Temporary	0.004	Wash on west side of road only.
P-49	5	Y	N	37°04.369N	114°15.994W	NA	Temporary	0.007	
P-50	4	Y	N	37°04.542N	114°15.994W	NA	Temporary	0.006	
P-51	4	Y	Y	37°04.685N	114°16.096W	NA	Temporary	0.006	
P-52	6	Y	N	37°04.819N	114°16.195W	NA	Temporary	0.008	

TABLE 2
Summary of Waters of United States Observed Within Alternative 1

Wash Designation	Wash Width (feet)	Intersects Pipeline	Parallels Pipeline	Latitude	Longitude	Approx. Milepost	Permanent or Temporary Impacts	Approximate Impact (acres)	Comments
P-53	5	Y	N	37°04.864N	114°16.218W	NA	Temporary	0.007	
P-54	50	Y	N	37°05.105N	114°16.429W	NA	Temporary	0.069	Sam's Camp Wash.
Total Impact:								0.383	

Notes:

- Waters of United States are numbered sequentially from south to north.
- Approximate latitude and longitude of Waters of United States were estimated using a hand-held global positioning unit, and have not been differentially corrected. GPS unit inoperable at some locations.
- Delineations of Waters of United States along alternative pipeline route were not specifically reviewed during a site visit with Grady McNure/USACE on November 14, 2002.
- Calculation of approximate area of impact based on construction right-of-way width of 60 feet.

TABLE 3
Summary of Waters of United States Observed Within Alternative 2

Wash Designation	Wash Width (feet)	Intersects Road	Parallels Road	Latitude	Longitude	Approx. Milepost	Permanent or Temporary Impact	Approximate Impact (acres)	Comments
Waters of United States Present in Immediate Vicinity of Proposed Access Road Between I-15 and the Southern Plant Site									
R-1	10	N	Y	36°46.754N	114°13.742W	0.3-0.8	Permanent	0.013	Wash located on west side of road, narrows from 10 feet to 4 feet in width. Approximately 40 feet from road at MP 0.3. At MP 0.9 wash is at edge of road and is 4 feet wide. If impacted on west side area of impact estimated to be 150 feet by 4 feet.
R-2	6	Y	Y	—	—	1.0	Permanent	0.007	Wash arises from roadside drainage, then flows east. Area of impact is approximately 50 feet in length and 6 feet width.
R-3	12	Y	N	36°49.288N	114°17.844W	3.2	Permanent	0.01	Existing single 36-inch culvert. Wash approximately 12 feet wide and potential impact may extend approximately 50 feet on western side of road. In Realignment Area #1.
R-4	4	Y	N	—	—	4.4	Permanent	0.06	Located within Realignment Area #3. Roadway cross section estimated to be 700 feet wide.
R-5	6	Y	N	36°50.220N	114°18.062W	4.5	Permanent	0.006	Existing single 12-inch culvert. Wash approximately 6 feet wide.
R-6	3	Y	N	36°50.311N	114°18.332W	4.7	Permanent	0.003	Existing single 24-inch culvert. Wash approximately 3 feet wide.
R-7	10	Y	N	36°51.445N	114°18.480W	6.0	Permanent	0.01	Single 36-inch culvert. Wash varies from 5 to 10 feet in width.
R-8	2	Y	N	36°51.486N	114°18.445W	6.5	Permanent	0.002	Single 24-inch culvert. Two small 1-foot washes converge.

TABLE 3
Summary of Waters of United States Observed Within Alternative 2

Wash Designation	Wash Width (feet)	Intersects Road	Parallels Road	Latitude	Longitude	Approx. Milepost	Permanent or Temporary Impact	Approximate Impact (acres)	Comments
R-9	10 to 20	N	Y	36°51.486N	114°18.481W	6.5-6.6	None	0	Wash located west of and near base of roadway and parallels road—road could be widened to the east to avoid impacts.
R-10	3	Y	N	36°52.407N	114°17.411W	7.8	Permanent	0.003	Existing culvert, wooden culvert marker 7-7/10. Flows west to wash. In Realignment Area #5.
R-11	20	N	Y	36°52.689N	114°17.072W	8.2	None	0	Wash parallels road on west side. Wash width varies from 15 to 20 feet wide; approximately 10 feet from road. In Realignment Area #5.
R-12	25	Y	N	36°52.840N	114°16.674W	8.7	Permanent	0.03	Existing three 36-inch culverts, wash approximately 25 feet wide. In Realignment Area #5.
R-13	15	Y	N	36°52.905N	114°16.657W	8.8	Permanent	0.02	Two 36-inch culverts, wash approximately 15 feet wide. In Realignment Area #5.
R-14	4	Y	N	36°53.097N	114°16.285W	9.2	Permanent	0.004	Existing 24-inch culvert, wooden culvert marker 9-1/10. Wash approximately 4 feet wide.
R-15	6	Y	N	36°53.459N	114°16.058W	9.7	Permanent	0.006	Existing double 36-inch culverts, wooden culvert marker 9-5/10. Wash width between 4 and 6 feet.
R-16	6	Y	N	36°53.499N	114°16.033W	9.7	Permanent	0.006	Existing single culvert, wash approximately 6 feet wide.
R-17	10	Y	N	36°53.660N	114°16.029W	10.0	Permanent	0.01	Existing single 36-inch culvert, wooden culvert marker 9-7/10. Wash width approximately 10 feet. In Realignment Area #6.
R-18	6	Y	N	36°53.856N	114°15.932W	10.4	Permanent	0.006	No culvert—wash width varies between 1 and 6 feet.

TABLE 3
Summary of Waters of United States Observed Within Alternative 2

Wash Designation	Wash Width (feet)	Intersects Road	Parallels Road	Latitude	Longitude	Approx. Milepost	Permanent or Temporary Impact	Approximate Impact (acres)	Comments
R-19	6	Y	N	36°53.893N	114°15.932W	10.4	Permanent	0.006	No existing culvert. In Realignment Area #7.
R-20	6	Y	N	36°54.040N	114°15.975W	10.6	Permanent	0.006	No existing culvert.
R-21	8	Y	N	36°54.109N	114°15.789W	10.8	Permanent	0.008	No existing culvert. In Realignment Area #8.
R-22	4	Y	N	36°54.272N	114°15.590W	11.1	Permanent	0.004	No existing culvert. In Realignment Area #8 and 9.
R-23	15	Y	N	36°54.403N	114°15.466W	11.3	Permanent	0.02	No existing culvert. In Realignment Area #9.
R-24	6	Y	N	36°54.444N	114°15.400W	11.4	Permanent	0.006	No culvert, wash consists of two small channels. Incised, gravel channels. In Realignment Area #9.
R-25	4	Y	N	36°54.568N	114°15.382W	11.6	Permanent	0.004	No existing culvert. In Realignment Area #10.
R-26	2	Y	N	36°54.626N	114°15.381W	11.7	Permanent	0.002	No existing culvert. In Realignment Area #10.
R-27	2	N	N	36°54.662N	114°15.381W	11.8	Permanent	0.002	Wash only on east side of road, but does not parallel road. In Realignment Area #10.
R-28	4	Y	N	36°54.742N	114°15.025W	11.9	Permanent	0.004	No existing culvert. In Realignment Area #10.
R-29	2	N	N	36°54.872N	114°15. W	12.1	Permanent	0.002	Wash only on east side of road, but does not parallel road.
R-30	2	N	N	36°54.958N	114°15. W	12.2	Permanent	0.002	Wash only on east side of road, but does not parallel road.
R-31	6	Y	N	36°54.998N	114°15.708W	12.3	Permanent	0.006	Wash on west side, then drains into road. In Realignment Area #11.

TABLE 3
Summary of Waters of United States Observed Within Alternative 2

Wash Designation	Wash Width (feet)	Intersects Road	Parallels Road	Latitude	Longitude	Approx. Milepost	Permanent or Temporary Impact	Approximate Impact (acres)	Comments
R-32	20	Y	N	36°55.012N	114°14.652W	12.4	Permanent	0.04	Two washes next to each other, both are 20 feet wide. In Realignment Area #11.
R-33	10	Y	N	36°55.094N	114°14. W	12.5	Permanent	0.01	No existing culvert; gravel substrate. In Realignment Area #11.
R-34	1	Y	N	36°55.471N	114°14.156W	13.1	Permanent	0.001	No existing culvert. In Realignment Area #12.
R-35	1	N	Y	36°55.730N	114°13.851W	13.5	Permanent	0.001	Wash only on east side of road, but does not parallel road. In Realignment Area #12.
R-36	3	Y	N	36°55.937N	114°13.707W	13.8	Permanent	0.003	Parallels road, then crosses road. No existing culvert. Same wash as Wash A on Plant Site.
R-37	2	Y	N	36°56.027N	114°13.522W	14.1	Permanent	0.002	No existing culvert, near southern edge of plant site. In Realignment Area #13. Same wash as Wash B on Plant Site.
R-38	6	Y	N	36°56.287N	114°13.673W		Permanent	0.006	No existing culvert.
Total Impact:								0.331	

Notes:

- Waters of United States are numbered sequentially from south to north.
- Approximate latitude and longitude of Waters of United States were estimated using a hand-held global positioning unit, and have not been differentially corrected. GPS unit inoperable at some locations.
- Delineations of Waters of United States were approved during a site visit with Grady McNure/USACE on November 14, 2002.
- Approximate roadway Milepost increases from south to north along existing track road and is based on auto odometer. Odometer set to 0.0 at end of existing pavement.
- Unless otherwise noted, calculation of approximate area of impact based on proposed typical roadway cross-section width of 45 feet.
- Realignment Areas drawings dated November 1, 2002.
- No waters of the United States are present within the footprint of the northern plant site.

TABLE 3
Summary of Waters of United States Observed Within Alternative 2

Wash Designation	Wash Width (feet)	Intersects Pipeline/Road	Parallels Pipeline/Road	Latitude	Longitude	Approx. Milepost	Permanent or Temporary Impacts	Approximate Impact (acres)	Comments
Waters of United States Present In Immediate Vicinity of Proposed Water Line and Roadway Improvements Between the Southern Plant Site and the Northern Plant Site									
P-1	3	Y	N	36°56.364N	114°13.742W	NA	Temp and Perm	0.004	
P-2	4	Y	N	36°56.543N	114°13.623W	NA	Temp and Perm	0.006	
P-3	2	Y	N	36°56.854N	114°13.413W	NA	Temp and Perm	0.003	
P-4	2	Y	N	36°56.885N	114°13.397W	NA	Temp and Perm	0.003	
P-5	3	Y	N	36°56.987N	114°13.324W	NA	Temp and Perm	0.004	
P-6	5	Y	N	36°57.004N	114°13.318W	NA	Temp and Perm	0.007	
P-7	5	Y	N	36°58.421N	114.13.098 West	NA	Temp and Perm	0.007	
P-8	3	Y	N	36°58.249N	114.13.101 West	NA	Temp and Perm	0.004	
P-9	2	Y	N	36°58.068N	114.13.098 West	NA	Temp and Perm	0.003	
P-10	3	Y	N	36°58.018N	114.13.101 West	NA	Temp and Perm	0.004	
P-11	10	Y	N	36°57.953N	114.13.102 West	NA	Temp and Perm	0.014	
P-12	2	Y	N	36°57.920N	114.13.102 West	NA	Temp and Perm	0.003	

TABLE 3
Summary of Waters of United States Observed Within Alternative 2

Wash Designation	Wash Width (feet)	Intersects Pipeline/Road	Parallels Pipeline/Road	Latitude	Longitude	Approx. Milepost	Permanent or Temporary Impacts	Approximate Impact (acres)	Comments
P-13	6	Y	N	36°57.864N	114.13.100 West	NA	Temp and Perm	0.008	
P-14	2	Y	N	36°57.845N	114.13.102 West	NA	Temp and Perm	0.003	
P-15	2	Y	N	36°57.832N	114.13.101 West	NA	Temp and Perm	0.003	
P-16	2	Y	N	36°57.805N	114.13.099 West	NA	Temp and Perm	0.003	
P-17	5	Y	N	36°57.707N	114.13.103 West	NA	Temp and Perm	0.007	
P-18	2	Y	N	37°00.116N	114°13.637W	NA	Temp and Perm	0.003	
P-19	2	Y	N	37°00.116N	114°13.637W	NA	Temp and Perm	0.003	Approximately 25 feet from Wash 21.
P-20	4	Y	Y	37°00.250N	114°13.894W	NA	Temp and Perm	0.006	
P-21	2	Y	N	37°00.447N	114°13.929W	NA	Temp and Perm	0.003	
P-22	2	Y	Y	37°01.029N	114°14.236W	NA	Temp and Perm	0.003	One wash on each side of road, each 2 feet wide.
P-23	1	Y	N	37°01.454N	114°14.236W	NA	Temp and Perm	0.001	
P-24	1	Y	N	37°01.494N	114°14.398W	NA	Temp and Perm	0.001	
P-25	6	Y	N	37°01.578N	114°14.433W	NA	Temp and Perm	0.008	
P-26	3	Y	Y	37°01.612N	114°14.434W	NA	Temp and Perm	0.004	Between survey stakes 1251 and 1252.

TABLE 3
Summary of Waters of United States Observed Within Alternative 2

Wash Designation	Wash Width (feet)	Intersects Pipeline/Road	Parallels Pipeline/Road	Latitude	Longitude	Approx. Milepost	Permanent or Temporary Impacts	Approximate Impact (acres)	Comments
P-27	1	Y	Y	37°01.720N	114°14.449W	NA	Temp and Perm	0.001	Wash on east side only, flows into road.
P-28	3	Y	Y	37°01.881N	114°14.495W	NA	Temp and Perm	0.004	Road would impact wash, but pipeline would not.
P-29	3	Y	N	37°02.090N	114°14.871W	NA	Temp and Perm	0.004	
P-30	2	Y	Y	37°02.145N	114°14.900W	NA	Temp and Perm	0.003	Desert tortoise in burrow noted near this location.
P-31	10	Y	N	37°02.387N	114°14.799W	NA	Temp and Perm	0.014	
P-32	10	Y	N	37°02.531N	114°14.781W	NA	Temp and Perm	0.014	
P-33	15	Y	N	37°02.687N	114°14.781W	NA	Temp and Perm	0.021	Three washes converge at road.
P-34	8	Y	Y	37°02.743N	114°14.803W	NA	Temp and Perm	0.011	Several washes converge at road.
P-35	3	Y	N	37°02.816N	114°14.842W	NA	Temp and Perm	0.004	
P-36	2	Y	N	37°02.842N	114°14.869W	NA	Temp and Perm	0.003	
P-37	2	Y	N	37°03.005N	114°14.876W	NA	Temp and Perm	0.003	
P-38	15	Y	N	37°03.179N	114°14.892W	NA	Temp and Perm	0.021	
P-39	2	Y	N	37°03.592N	114°15.082W	NA	Temp and Perm	0.003	
P-40	1	Y	N	37°03.684N	114°15.153W	NA	Temp and Perm	0.001	

TABLE 3
Summary of Waters of United States Observed Within Alternative 2

Wash Designation	Wash Width (feet)	Intersects Pipeline/Road	Parallels Pipeline/Road	Latitude	Longitude	Approx. Milepost	Permanent or Temporary Impacts	Approximate Impact (acres)	Comments
P-41	10	Y	N	37°03.744N	114°15.216W	NA	Temp and Perm	0.014	
P-42	1	Y	N	37°03.800N	114°15.249W	NA	Temp and Perm	0.001	
P-43	10	Y	N	37°03.849N	114°15.309W	NA	Temp and Perm	0.014	
P-44	5	Y	N	37°03.923N	114°15.389W	NA	Temp and Perm	0.007	
P-45	5	Y	Y	37°03.980N	114°15.443W	NA	Temp and Perm	0.007	
P-46	3	Y	N	37°04.040N	114°15.493W	NA	Temp and Perm	0.004	Two channels 15 feet apart that cross road—see next entry.
P-47	3	Y	N	37°04.040N	114°15.493W	NA	Temp and Perm	0.004	Two channels 15 feet apart that cross road—see previous entry.
P-48	3	Y	N	37°04.334N	114°15.800W	NA	Temp and Perm	0.004	
P-49	5	Y	N	37°04.369N	114°15.994W	NA	Temp and Perm	0.007	
P-50	4	Y	N	37°04.542N	114°15.994W	NA	Temp and Perm	0.006	
P-51	4	Y	Y	37°04.685N	114°16.096W	NA	Temp and Perm	0.006	Wash on west side of road only.
P-52	6	Y	N	37°04.819N	114°16.195W	NA	Temp and Perm	0.008	

TABLE 3
Summary of Waters of United States Observed Within Alternative 2

Wash Designation	Wash Width (feet)	Intersects Pipeline/Road	Parallels Pipeline/Road	Latitude	Longitude	Approx. Milepost	Permanent or Temporary Impacts	Approximate Impact (acres)	Comments
P-53	5	Y	N	37°04.864N	114°16.218W	NA	Temp and Perm	0.007	
P-54	50	Y	N	37°05.105N	114°16.429W	NA	Temp and Perm	0.069	Sams Camp Wash.
Total Impact:								0.383	

Notes:

- Waters of United States are numbered sequentially from south to north.
- Approximate latitude and longitude of Waters of United States were estimated using a hand-held global positioning unit, and have not been differentially corrected. GPS unit inoperable at some locations.
- Delineations of Waters of United States along alternative pipeline route were not specifically reviewed during a site visit with Grady McNure/USACE on November 14, 2002.
Impacts associated with the water pipeline are temporary, whereas impacts associated with the roadway improvements are permanent.
- The roadway and pipeline in this segment are in close proximity, thus the same wash designation is used for both. Calculation of approximate area of impact based on construction right-of-way width of 60 feet for the pipeline.